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# THE CAYAPA INDIANS OF ECUADOR

BY

S. A. BARRETT

PART I

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THIS series of INDIAN NOTES AND MONOGRAPHS is devoted primarily to the publication of the result of studies by members of the staff of the Museum of the American Indian, Heye Foundation, and is uniform with HISPANIC NOTES AND MONOGRAPHS, published by the Hispanic Society of America, with which organization this Museum is in cordial coöperation.

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# THE CAYAPA INDIANS
# OF ECUADOR

BY

S. A. BARRETT

PART I

[p. iii]

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3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

## CONTENTS OF PART I

PAGE
Phonetic Key . . . . . . . . . . x
Preface . . . . . . . . . . xi
Territory . . . . . . . . . . 1
  Geographical Situation . . . . . . . . . . 1
  Climate . . . . . . . . . . 3
  Resources . . . . . . . . . . 6
    Trees and Plants . . . . . . . . . . 6
    Game . . . . . . . . . . 11
    Mammals . . . . . . . . . . 12
    Birds . . . . . . . . . . 13
    Reptiles and Amphibians . . . . . . . . . . 14
    Fish . . . . . . . . . . 14
    Mollusks . . . . . . . . . . 14
    Crustacea . . . . . . . . . . 15
    Insects . . . . . . . . . . 15
    Minerals . . . . . . . . . . 23
  Health Conditions . . . . . . . . . . 25
  Surrounding Peoples . . . . . . . . . . 26
History . . . . . . . . . . 31
Daily Life . . . . . . . . . . 39
Material Culture . . . . . . . . . . 45
  Buildings . . . . . . . . . . 45
  Dress . . . . . . . . . . 63
  Food and Its Preparation . . . . . . . . . . 72
  Agriculture . . . . . . . . . . 79
  Hunting . . . . . . . . . . 111
  Fishing . . . . . . . . . . 121
  War . . . . . . . . . . 132
Manufactures . . . . . . . . . . 133
  Canoe-making and Canoeing . . . . . . . . . . 133
  Wooden Implements . . . . . . . . . . 154
  Stone Implements . . . . . . . . . . 163
  Calabash Implements and Utensils . . . . . . . . . . 166
  Pottery . . . . . . . . . . 173

[P. VI IS Blank]

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# ILLUSTRATIONS

## Plates

FACING PAGE
Map of the territory occupied by the Cayapa Indians........ 1
i. Dwelling and adjoining cane-mill........ 46
ii. Dwelling showing roof extension and riders........ 47
iii. Typical dwellings along the river........ 48
iv. Priest's house and church at Sapayo Grande........ 49
v. Dwelling showing railing in lieu of walls........ 50
vi. The cane-mill........ 51
vii. Unfinished house, showing roof structure........ 52
viii. Village of Punta Venado........ 53
ix. Distant view of Punta Venado........ 54
x. Chief's house, Sapayo Grande........ 55
xi. Ground-plan of chief's house........ 56
xii. Suspension hooks........ 57
xiii. Details of house construction........ 58
xiv. Storage platform or loft........ 59
xv. Harvesting cane........ 62
xvi. Youth in ordinary costume........ 63
xvii. Man and woman in everyday dress........ 62
xviii. A typical family group........ 63
xix. Woman wearing necklace and bracelets........ 64
xx. Woman wearing double manta........ 65
xxi. Woman's customary coiffure........ 64
xxii. Single manta and tasseled girdle........ 65
xxiii. A family group........ 64
xxiv. Fiesteros and church at Punta Venado........ 65
xxv. Young men dressed for fiesta........ 64
xxvi. A typical hair-cut........ 65
xxvii. Fiesta costume........ 64
xxviii. Fiesta costume completed with a vest........ 65
xxix. Fiesta costume with foreign hat........ 66
xxx. Fiesta costumes........ 67
xxxi. Boy dressed for fiesta........ 66
xxxii. Boy dressed for fiesta........ 67

000

FACING PAGE
XXXIII. Fiesta costumes ........ 66
XXXIV. Fiesta costume ........ 67
XXXV. Fiesta costume ........ 66
XXXVI. Fiesta costume ........ 67
XXXVII. Boys dressed for fiesta ........ 66
XXXVIII. Boys dressed for fiesta ........ 67
XXXIX. Face paintings ........ 68
XL. Face paintings ........ 69
XLI. Face paintings ........ 68
XLII. Face paintings ........ 69
XLIII. Face paintings ........ 68
XLIV. Face paintings ........ 69
XLV. Face paintings ........ 68
XLVI. Face paintings ........ 68
XLVII. Face paintings ........ 68
XLVIII. Face paintings ........ 68
XLIX. Arm paintings ........ 70
L. Arm paintings ........ 71
LI. Leg paintings ........ 70
LII. Leg paintings ........ 71
LIII. Necklaces of beads and of seeds ........ 70
LIV. Neck ornament of seeds ........ 71
LV. Necklaces ........ 70
LVI. Wrist and neck ornaments ........ 71
LVII. Oyster-shell kitchen-midden ........ 72
LVIII. Drying platform ........ 73
LIX. Plantain field ........ 74
LX. Harvest of plantains ........ 75
LXI. Mashers, chocolate stirrers, and food paddles. 76
LXII. Mealing block and stones, and wooden trays .. 77
LXIII. Utensils for making rum ........ 84
LXIV. Sugar-cane stacked beside the mill ........ 85
LXV. Still, canoe-shape dish, and dipper ........ 86
LXVI. Pita leaves for making cord ........ 87
LXVII. Impounding trap for shad ........ 126
LXVIII. Near view of spring trap ........ 127
LXIX. Canoe-making ........ 134
LXX. Canoe-making ........ 135
LXXI. Placing of cross-bars for transporting the canoe ........ 136
LXXII. Decorative patterns painted on canoes ........ 137
LXXIII. Decorative patterns painted on canoes ........ 138

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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FACING PAGE
LXXIV. Decorative patterns painted on canoes....... 139
LXXV. Decorative patterns painted on canoes....... 140
LXXVI. Paddle handles and blades.................. 141
LXXVII. Leaves used to rub down paddles............ 149
LXXVIII. Canoeing on the Rio Cayapas............... 150
LXXIX. Canoe piloted by a woman.................. 151
LXXX. Canoe piloted by a man.................... 150
LXXXI. Canoeing on the Rio Cayapas............... 151
LXXXII. Canoeing on the Rio Cayapas............... 154
LXXXIII. Wooden seats and bases................... 155
LXXXIV. Carved wooden toys....................... 162
LXXXV. Musical tops.............................. 163
LXXXVI. Designs on calabash utensils.............. 172
LXXXVII. Forms of pottery vessels.................. 173
LXXXVIII. Pottery vessels set to dry................ 174
LXXXIX. Firing pottery............................ 175
XC. Pottery after firing...................... 176

FIGURES

1. Types of ladders.................................. 46
2. Details of frame construction..................... 51
3. Details of frame construction..................... 51
4. Notches for receiving stringers................... 52
5. Corner of superstructure seen from interior....... 52
6. Beater for bark cloth............................. 106
7. Dart and quiver of blow-gun....................... 113
8. Deadfall trap for small mammals................... 119
9. Fish-line with pottery sinker..................... 131
10. Modern adz used in making canoes.................. 139
11. Handle of adz..................................... 140
12. Device for smoking out bees....................... 144
13. Calabash vessel and woven ring.................... 170

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

104

# PHONETIC KEY

## VOWELS

| | | |
|---|---|---|
| i | ī | î |
| e | ē | |
| a | | |
| o | ō | |
| u | ū | û |
| ai | | |

## CONSONANTS

| | Post-palatal | Medio-palatal | Pre-palatal | Dental | Labial-dental | Bi-labial |
|---|---|---|---|---|---|---|
| Stop.......... | k g | | t d | *t* | f v | p b |
| Spirant....... | | c | s | | | |
| Nasal......... | ñ | | n | | | m |
| Lateral....... | | | l | | | |
| Inverted...... | | | r | | | |

y, h, w, as in English.

tc as *ch* in church.

ts as in sits.

ty, ly, dy, dipthongal combinations.

The apostrophe (') indicates a strong aspiration.

ⁿ nasalization.

## PREFACE

THE information contained in this volume was obtained 114
during the period from July, 1908, to April, 1909,
when the author lived with the Cayapa Indians of
northwestern Ecuador. This work was suggested to 121
Mr George G. Heye by Prof. Marshall H. Saville,
when he found the rich archeological deposits at La
Tolita, near the mouth of Rio Santiago, and was undertaken
for the purpose of obtaining information with
which to solve certain problems connected with the
highly developed prehistoric art in pottery and metalwork
shown especially in and about the mounds at La
Tolita. The results of the present research have failed
to give any clew to the manufacturers of these archeological
objects, owing to the great antiquity of the culture
represented by them and to the fact that the Cayapa
Indians are comparatively recent immigrants into this
region. However, many interesting and important
observations concerning the ethnology of the region
were made, and the results of these are here offered as a
contribution to the ethnology of this hitherto little
known region of northwestern South America. Forming 122
as they did a part of the field research of the
Marie Antoinette Heye Expedition, the studies whose
results are the subject of the present work were due
to Mrs Heye's interest and generous patronage.

The author left San Francisco in June, 1908, so calculating 114
the time of his journey as to connect, via New
Orleans and Colon, with a vessel of the Pacific Naviga-

114 tion Company at Panama for Esmeraldas. Owing, however, to the irregularity of schedule along this western coast, it was necessary to remain a fortnight in Panama until the next steamer sailed. The arrival of this vessel from the south brought a welcome visit from Professor Saville, who, returning from a summer's archeological research in Ecuador, was able to give further valued information concerning the region to be visited and the encouraging news that health conditions there were then favorable.

Finally, after a voyage of five days, with the usual stops at Buenaventura and Tumaco, our vessel dropped anchor in the harbor of Esmeraldas, where the author was warmly greeted by Mr George D. Hedian, American consular agent at Esmeraldas. Mr Hedian had known Professor Saville for three years and had participated with him in the archeological expedition of the previous summer. His cordial interest, therefore, was threefold: that of a consul, that of a coworker, and, above all, that interest born of whole-souled friendship, as was amply proved throughout the author's stay in the region, and especially evidenced by his fraternal kindness in times of illness and on many other occasions. Mr
[12] Hedian's good advice concerning methods of travel and health precautions, and his kind offices in arranging matters of business concerning the expedition, were a result of long residence in the region and of thorough knowledge of the country and its people. The writer takes this opportunity to express his personal appreciation of Mr Hedian's many courtesies.

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

It seemed best for the writer to remain in Esmeraldas 114 for about a week in order to recuperate from a slight 122 fever contracted at Tumaco during a canoe trip of a few hours to inspect the mounds on El Morro island in the bay of Tumaco. During this week he also had an opportunity to meet all the people of importance in Esmeraldas, the capital and chief city of the province of the same name, and to outfit so far as was necessary for the trip up the Rio Cayapas. Among others the author met the Governor of the province, who kindly gave him letters of recommendation to the local teniente político at La Tolita.

Finally, passage was obtained for La Tolita on a balandra, or small sloop. The author was accompanied by Mr Hedian, who had arranged his affairs in order to accompany him among the Indians and to see that he was properly introduced to some of their head-men.

After a journey of two days we disembarked at La 114 Tolita, where we were hospitably received by Señor Don Pablo I. Sánchez, owner of the hacienda, and by Señor Don Calixto Ramírez, his business manager. Both of these estimable Spanish gentlemen facilitated in every way the work of the expedition, and it is a pleasure to acknowledge their many kindnesses. Mention must also be made of the tender care given the author during illness by these two and by Señora Sánchez, Señor Don Maximiliano Sánchez, and Señor Don Manuel. Acknowledgment should also be made to these friends for their interest in obtaining a considerable collection of pottery and stone objects from

La Tolita mines, which were presented to the author for the collections of what later became the Museum of the American Indian, Heye Foundation.

This opportunity is taken to acknowledge also our indebtedness to Señor Don Donato Yannuzzelli, of Palma, and to his brother Señor Don Antonio Yannuzzelli, of Esmeraldas, as also to Messrs Dumarest Brothers and others for various favors which contributed to the success of our undertaking.

After several days spent in preparation at La Tolita, we embarked on our canoe trip up the Rio Cayapas, arriving on the second day at the house of Señor Don José Trejo, Secretario de la Gobernación of the Punta Venado division of the Cayapa, who, on being assured that we were not connected with some new mining project, cheerfully permitted us to establish camp in his cane-mill on the bank of the river opposite his house.

After remaining two days, Mr Hedian returned down the river, leaving the author to establish further friendly relations which would enable him to prosecute his investigations to advantage. By care and diplomacy the Indians were convinced that the expedition was not secretly prospecting for mining properties, and that there was no danger of interference with their lands and liberties. In due time, therefore, friendly relations were effected, especially with Don José, and with Señor Don Antonio Napa, head chief, or gobernador, of the Punta Venado division; and ultimately the confidence of the latter particularly, and of various others, was gained to such an extent that it was possible to procure

114

the desired information concerning the entire culture of the Cayapa people, given in detail in this volume, as well as notes on the language which will appear later. It is fitting that acknowledgment be made here to the Cayapa Indians for their generous hospitality and assistance, contrary to the rule obtaining in North America, almost wholly without direct compensation other than a little medical aid now and then. Especially should acknowledgment be made to their chief, Don Antonio, who made the author virtually a member of his household, and who, together with the other members of his family, facilitated the investigation in every way.

The plates in this volume were reproduced from negatives made by the author in the field and from photographs of specimens collected while the work was in progress and now in the Museum of the American Indian, Heye Foundation. A similar collection was gathered at the same time for the Königlicher Museum für Völkerkunde in Berlin. The drawings of the objects in the Museum of the American Indian, Heye Foundation, were made by Mr Rudolph Weber and Mr William Baake of New York, and Mr George Peter of Milwaukee.

The detail map of the Cayapa region is based on Basurco's map, made for the provincial government, bearing the title "Plano Topográfico del Rio Cayapas y sus Principales Afluentes Levantado en Diciembre de 1891 por Santiago M. Basurco, Ingeniero de la Comisión Exploradora." The Governor of the Province of Esmeraldas courteously permitted the author to make a copy of this map, which proved very useful in

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

114 many ways. Investigation showed, however, that the map is not entirely correct in certain details; but these imperfections were adjusted on the copy, and further additions were made from a map placed at the disposal of the Museum by the courtesy of the American Geographical Society of New York.

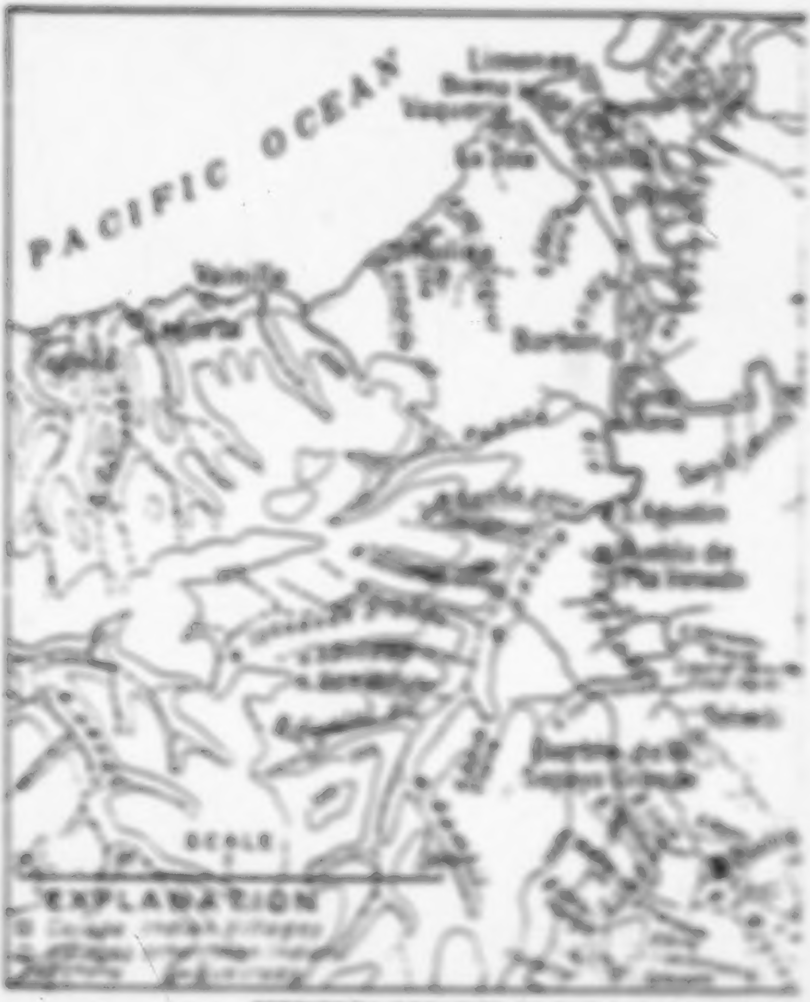
The elaboration of the results of the field work into their final form has been accomplished under many difficulties, since in large measure it has been necessary to perform the task at odd moments after the author's regular duties as a museum curator were finished day by day. Furthermore, the absence of an adequate library within easy reach has added to the difficulties. Acknowledgment is made to The Field Museum of Natural History, of Chicago, for the special privilege of consulting, on Sundays, its books dealing with South America, these being the only days it was possible to visit Chicago for the purpose.

[illegible] The author takes this opportunity to express his appreciation of the hearty coöperation and of the many valuable suggestions of Professor Saville and of the late George H. Pepper in the preparation of this work; and especially does he wish to acknowledge his gratitude to Mr Heye for his constant encouragement and sympathetic interest.

S. A. Barrett

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

131
133
487


PACIFIC OCEAN
Limones
Borbón
SCALE
EXPLANATION
Cayapa Indian villages

TERRITORY OCCUPIED BY THE CAYAPA INDIANS

[p. xii, 70]

3: Barrett E-5 (1906-1909)1925
SD6 Cayapa SD6

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153
987

FRONTISPIECE

PACIFIC PROVINCE OF ESMERALDAS ECUADOR

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3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

# THE CAYAPA INDIANS OF ECUADOR

By S. A. Barrett

## TERRITORY

### Geographical Situation

[3] [10] THE people known as the Cayapa Indians live at present almost wholly on the main and tributary streams of the Río Cayapas, one of the large rivers of the northwestern part of the Province of Esmeraldas, Ecuador, and about ninety miles in a direct line north of the equator. Their [illegible] territory is within comparatively easy reach of the ocean, which almost all visit at least once a year.

There are a few, perhaps an aggregate of one hundred individuals, who live in several other localities, namely, on the adjacent Río Santiago, at Pueblo Viejo, and at points along the immediate coast from the Río Dulcis, a few miles south of the town of Esmeraldas, the capital of the province, northward to the Río Rosario, about eight miles southeast of Tumaco, in the extreme southern-[16] western part of Colombia. However, practically all the Cayapa, approximating fifteen hundred to two thousand individuals, now live on or in the immediate vicinity of the river which bears their name.

[33] The Río Cayapas heads in the western slope of the coast range of the Andes at a point not far from Mt Cotacachi, which attains an altitude of 16,290 feet (4,966 meters). The western slope of this sierra is

[33 very abrupt; it soon gives place to the broad coastal plain which stretches thence to the ocean and which is broken only by low foot-hills in its eastern part near the higher mountains, and by short, isolated, low ranges of hills and individual hills in its western part nearer [3] the coast. The portion of this coastal plain now occupied by the Cayapa is that along the lower course of the Rio Cayapas and its tributaries. There are very few, if any, who reside as far as the lowest of the foot-hills of the coast range.

[33 The lower course of the Rio Cayapas is wide, very deep, and sluggish; but immediately above tidewater it is a swift, more or less shallow stream, with numerous rapids, and in its upper course its current is so rapid that it may be ascended by canoe only with difficulty, even when not in flood. At time of very high water, on the other hand, the river is quite impassable at certain rapids, especially that known as Corriente Grande. The nature of the coastal plain is such as to produce numerous rapids, some of them of considerable extent, but, so far as it was possible to ascertain, there are no cataracts along the lower course of the river.

To the east of the coast range of the Andes, and separating it from the much higher sierra, spreads an extensive valley, at a lofty altitude, in which are situated the chief interior cities of Ecuador, including Quito (9,350 feet, or 2,850 meters), Ibarra (7,300 feet or 2,230 meters), and others. It was here, according to [[73] their traditions, that the Cayapa formerly lived. Beyond this great main range of the Andes lies the vast Amazon basin.

The conditions prevailing in this high interior valley offer great contrast with those under which the Cayapa now live, not only as to topography, but also as to climate, natural resources, modes of travel, the nature of their habitations, the food supply, and in various other particulars. 153

## Climate

The climatic conditions of the territory of the Río Cayapas are typically tropical. The temperature is equable throughout the year, the maximum day temperature ranging, so far as it was possible to determine, between 70° and 85° Fahrenheit.[1] Rains are of almost 132

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[1] "The temperature at night ranges from 65 to 75 degrees Fahr., on cloudy days from 70 to 80 degrees Fahr., and on sunny days from 75 to 85 degrees. The latter degree I have experienced but twice in seven or eight months' residence. . . . . Although almost directly under the equator, that burning equatorial heat and those malignant fevers of which we read, are here unknown. The cause of this salubrious climate is the moisture-laden current which, sweeping by the Gallapagos islands, reaches this portion of the Ecuadorian coast and deposits its moisture as it strikes the slopes of the Andes. The clouds shield the country from the direct rays of the sun, the copious rains wash the country clean, the snows furnish cooling water, while constant evaporation tempers and cools the air."—Extract from the report of the engineer to the United States Gold Dredging and Rubber Company, on the Río Santiago. This report was based on observations made during 1905-06. A report made by another engineer of the same company for the month of May, 1905, gives the night temperature as ranging between 60°-67°F., and the day temperature as ranging between 67°-78°F. The daily rainfall is given in this report as ranging from 0.43 inch to 0.87 inch.

178 daily occurrence, although the year is divided into a so-called wet season and a so-called dry season. The former corresponds to the fall, winter, and spring months, and the latter to the summer months of the North Temperate zone. At all times, however, this particular region is bountifully supplied with rain, although it is only a short distance north of the more arid portions of the western coast of South America. Beginning with the region about the Río Esmeraldas, the rainfall rapidly decreases toward the south, and save in a few exceptional areas the territory becomes correspondingly more arid. Even at such a short distance as Manabí the aridity is very noticeable, and still farther to the south, on the Peruvian coast, the country is very arid. To the north, on the other hand, as far as southern Mexico, the rainfall is very abundant, and in some sections may even exceed in volume that of the Cayapa region.

It was not feasible on the present expedition to carry apparatus for measuring the precipitation exactly, but according to systematic observations[1] made during the first three months of 1905, in April, 1906, and again in May, 1908, on the Río Santiago, a few miles distant from the Río Cayapas, and a part of the same drainage system, the daily precipitation ranged from .81 inch to .87 inch, or a total annual precipitation of from 24.63 to 26.46 feet. If data were available for every month of the year, it is not improbable that these figures would be found to vary. Further, if obser-

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[1] See Note 1, page 3.

132 vations extending over a series of years were available, it would probably be found that the precipitation varies considerably from year to year. For instance, according to reports the winter months of 1909-10 were attended by an unprecedented rainfall. On the whole, therefore, it is safe to assume that the observations of the engineers referred to represent a fair average of the precipitation of this region.

133 731 In consequence of the great rainfall and the constant saturation of the ground, floods are frequent along all the rivers of this region. These freshets come, of course, only when there is a continuous and an unusually heavy fall of rain for several hours, or, as sometimes happens, for several days. In the latter event the Rio Cayapas rises several feet at its mouth, which is itself upward of a mile wide, and where the lowness of the bordering lands permits the stream to spread over wide areas. Farther up-stream, where the hills confine its waters, the river rises much higher; and at some points, where for considerable distances there are no low flood-plains and where the banks are steep, it rises as high as fifty feet.

731 [342] 361 [487] As a result of such conditions there has been developed a form of pile-dwelling, the floor of which is raised from six to twelve feet above the ground. The Cayapa always endeavor to build their houses as near the river as possible, on account of their dependence on it as a means of travel and for other purposes. The floods, however, must always be taken into account in selecting a site even for such a pile-dwelling, since at times of such

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361 floods it not infrequently happens that the waters rise so high as completely to surround the house, and indeed sometimes to within a few inches of its floor.

132 The excessive rainfall naturally produces great humidity,[3] which would be very oppressive were it not for the fact that the sky is almost constantly overcast, so that the full power of the sun is rarely felt in the region. This fortunate circumstance renders the climate, which would otherwise be almost intolerable, very equable and pleasant.

## RESOURCES

### TREES AND PLANTS

137 By virtue of the climatic conditions above set forth the vegetation of the Cayapa region is typically tropical. Almost every foot of ground is covered by a dense jungle growth comprising many species of trees, palms, shrubs, and smaller plants, and characterized by an abundance of vines and parasitic vegetation. So dense is this growth that it is practically impossible to travel on land even a short distance without the use of a machete.

137
224 Among the most important and characteristic plants of the region are the various species of palms, many of which are put to use by the Cayapa in one way or another. In the following list[1] of the trees and plants of this section are given the Cayapa and the local Spanish names of those palms which are most useful to the

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[3] One of the engineer's reports, above referred to, places the humidity at an average of about 80 per cent.

[1 [illegible] Cat. 116, pp. 9-11. A]

Indians. A number of these palms produce foods, 137
and several provide leaves which are used in making 824
house-thatch, while the trunk of one makes a durable
flooring for houses. These matters will be taken up
more specifically in the discussion of these subjects.

Another characteristic plant is the giant bamboo, 137
which grows in clumps at frequent intervals along the
banks of the rivers, especially along their lower courses.
This bamboo often reaches a height of seventy feet or
more, and has a basal diameter approximating ten
inches. These immense stems serve various useful [342]
purposes, among the most important of which may be
mentioned that of joists and rafters in house-building.

There is a great variety of trees in the jungle, many 137
of which produce useful woods. Perhaps the most 342
important uses of wood among the Cayapa are in house 396
construction and in canoe-making. In the former the
guayacan, which provides the almost indestructible
pillars that support the pile structures, is of greatest
importance. Several varieties of trees are used in canoe-making, but two or three kinds are preferred to all
others.

Another characteristic of the jungle is the association 137
of many species of plant life together in one area.
Whereas in the North Temperate zone it is customary
to see large tracts of land occupied by a single principal
species of tree, such as the pine, in this Ecuadorian
region a considerable number of trees of one species
growing close together and in such manner as to form
anything comparable with a grove is rarely seen. As a

137 rule the various species of trees are associated in a strictly heterogeneous manner, and in all cases there is a fairly dense undergrowth, besides vines and aerial roots in abundance. These latter hang from the trees in such profusion as alone to make it necessary to cut a trail in proceeding even for a short distance by land. 824 137 Of these aerial roots the one known by the local Spanish term *pitigua* deserves special mention. It is very strong and durable, is little affected by climate, [342] and is not attacked by insects. It is, therefore, extensively employed in binding joints in house-building, and indeed wherever a good binding material is needed. [285] It is also extensively used in making certain kinds of basketry.

This general mention of the natural vegetal resources of the Cayapa region will suffice for present consideration, but the separate plants and their particular uses will be treated in detail in the following pages in connection with matters with which they are particularly concerned.

The heterogeneity of the flora of the region, above referred to, is fortunate for its inhabitants, since it places nearly every kind of plant, on which so much of the culture of the Cayápa Indians depends, within comparatively easy reach of all. That the flora should be so varied in any given locality, and that any given species should be so generally distributed, is due to the almost identical climate, soil, and other environmental conditions throughout the region.

The following is a list of the principal vegetal resources, both indigenous and introduced, employed by the Cayapa:

**3: Barrett E-5 (1908-1909)1925**

**SD6 Cayapa SD6**

137
192
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### *Trees and Plants*

| English | Spanish | Cayapa |
|---|---|---|
| | guayacan | waiaka'n[a] |
| rubber | caucho | sa'be |
| cedar | cedro | inũ'n-tci, or inõ'n-tci |
| | guadaripo | tũ-tci |
| | amarillo | pitõa'lõ |
| | balsa | na'na |
| | dama jaua | te'cki-tci or tũ'cki-tci |
| | achote | ca'imũ (canyũñ-tci = the shrub) |
| | hawa | ma'iñ-tci |
| | guabo | ci'lyũ (ci'-tci = the tree). See p. 109 |
| | guabo macheton | macti-pa' cĩlyũ |
| | guabo dulce | pi' cĩlyũ |
| | guabo tacoane | ni'ñga cĩlyũ |
| | guabo agria | sa' cĩlyũ |
| | | pũ' cĩlyũ |
| calabash | calabaza | wa'iyũ (wa'i-tci = the tree), also ca'lya |
| chocolate | cacao | kaka'bõ |
| papaw | papaya | papa'ia |
| | caimito | a'kũ'iñya (akũi'ñ-tci = the tree) |
| | zapote | tapõ'te |
| orange | naranjo | la'nsa (lansa'-tci = the tree) |

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[a] In some instances these names are invariably given by informants with *tci*, signifying tree, following the root of the word; in others this is never added unless it is intended particularly to show that the tree itself is meant. In some cases the addition of *tci* causes considerable phonetic change in the root. In those cases where the simple root form and also the compound form were obtained, the latter follows the former in parentheses.

| 137 | ENGLISH | SPANISH | CAYAPA |
|---|---|---|---|
| 192 | lemon | limon | lë'mō (lēmō'-tcï = the tree) |
| 824 | | chocolatillo | tcōkāila're, tcōkāilaí'a |
| | sandpaper tree | | lya'pic-hakï |
| | plantain | platano | pa'nda |
| | banana | seda | sē'da, sēda-kinī'a |
| | | hoja blanca | fi'ba-haki⁵ |
| | | hoja negra | e'lōā-hakï |
| | sugar-cane | caña dulce | e'lla |
| | wild cane | caña brava | ñya'nyï |
| | corn | maiz | pi'cū |
| | tobacco | tabaco | ta'kō |
| | | yuca | kū''tcū, kū'tctū |
| | | rascadera | rū'a |
| | pineapple | piña | tcī'lya |
| | pepper | aji | tyū |
| [177] | | yerba buena | ëvï vē'nū⁶ |
| | pumpkin | zapayo | ū |
| | | kuna-kuna | wa'-tcï |
| | | matamba | bī'ta |
| | | | nintcū'a⁷ |
| | | tangarea | dēū'a-tcï |

*Palms*

| ENGLISH | SPANISH | CAYAPA |
|---|---|---|
| ivory nut | palma tagua | tī'mō hōlō (tī'ō-tcï = the palm)⁸ |
| | palma real | ñya'-tcï |

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[5] This term, like the Spanish *hoja blanca*, signifies "white leaf."

[6] The name of this introduced plant is obviously a corruption of the Spanish.

[7] A porous vine used as a smoking material by children.

[8] In the majority of cases the names given by informants for these palms are combinations of the simple names of the palms with the word *tcï*, signifying "tree." The five cases in which the simple name was obtainable are here noted, the compound terms following them in parentheses.

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

| English | Spanish | Cayapa | 137 |
|---|---|---|---|
| | palma palmicha | sā'wī (sa'n-tcī = the palm) | 192 |
| | palma chonta dura | ka'imbī (kanō'-tcī = the palm) | 824 |
| | palma chapil or milpeso | kūla'pō-tcī | |
| | palma guividnande | viñga'-tcī | |
| | palma guinul | pūka''-tcī | |
| | palma pambil | bū'a (bū'iñ-tcī = the palm) | |
| | palma crespa | pī'nlya-tcī | |
| | palma chontilla | pĕ'aputc | |
| coconut | palma coco | kō'kō (kō'kō-tcī = the palm) | |
| fan-leaf palm | palma rampile | pī'tcūa<br>va'ha<br>kapi''m-tcī | |

### GAME

Game is abundant in the jungle, and there are fish 136 of various species in the streams. The ocean is within a comparatively short distance and its shores abound in many species of Crustacea and mollusks, as well as in the various salt-water fish, all highly prized by the Indians.

The specific uses of each species and its mode of capture, together with other points of interest in connection with it, will be taken up in detail at appropriate points in the following pages. For the present purposes it will be sufficient to give lists of the principal mammals, birds, fishes, Crustacea, mollusks, reptiles, and amphibians which are found in the region.

These lists, like the list of trees and plants previously given, are by no means complete, since they include

136 only the principal species with which the Indians are particularly concerned. Moreover, it is a source of regret that it is impossible, except in a very few instances, to give the scientific names of any of the species mentioned. It was originally intended that a collection
136 should be made of all those forms of vegetal and animal
121 life employed in any way by the Indians. In fact, a good beginning had been made in this matter, and considerable time had been spent in preparing mammal and bird skins during the first three months' residence on the river, but, unfortunately, during the author's illness from fever for nine weeks, these specimens were completely spoiled by insects and no time was available later to gather another collection. The only specimens saved were certain insects preserved in alcohol.

### MAMMALS

136
192

| English | Spanish | Cayapa |
|---|---|---|
| deer | venado | ma'na |
| wild hog | saino | aven-dû'cû, awen-dyû'cû |
| peccary | tatabara | na'-tcûcû, ne-tû'cû, ka'ne tyûcû |
| tame hog | puerco | kû''tcî, kö''tcî |
| (large rodent) | guanta | wala'mbû |
| (large rodent) | guatin | kö'yö, kû'yû |
| jaguar | tigre | kë'la, a-kë'la |
| black-marked species | | pabañe'la |
| red-marked species | | lakembî'lya |
| ocelot | tigrillo | tômañ-gë'la |
| puma | león | lyû-kë'la, lyû-kë'na |
| monkey | mono | wa'cû, wo'cû |

**3: Barrett E-5 (1908-1909)1925**
**SD6 Cayapa SD6**

136
192

| English | Spanish | Cayapa |
|---|---|---|
| monkey | mico, machin | cü'ri, cö'ri |
| howler monkey | mongon | hüyü'ngü |
|  | cusumbi | wa'cü, wa'ce |
| squirrel | ardilla | i-ya'mbü, ya'mbü |
| armadillo | armadillo | tcil-ya'mbü |
| rat (large species of wood rat) | raton | î'yö |
| rat (small species) |  | pakila'la |
|  | zorra | ci'ni |

BIRDS

| English | Spanish | Cayapa |
|---|---|---|
| toucan | paliton | tcandü'tü (o)[8] |
| toucan (small species) | pichilingo | pi'tci (o) |
| grouse | perdiz | ü'ndürürü,<br>ö'ndürürö (o) |
| turkey, wild | pava, drumalona | ê'li |
| turkey, wild | pavon, cantona | ka'ntsü |
| turkey, domestic | pava | kasti'lya walya'pa |
| dove | paloma | mabö''kö (o)<br>pastö''kö (o)<br>wa'pü'pü (o) |
| buzzard | gallinaso | kü'ndürürü,<br>petyü'tyü |
| pelican | alcatraz | nana''ka |
|  | guacharaca | watcara'ka (o) |
| frigate bird |  | nyambiva'tü |
| hawk | gabilan | hüya'lyü |
| hawk | gabilan de machin | cüi hüya'lyü |
| hawk | gabilan de mono | wac hüya'lyü |
|  | canchimalo | tcaŋgö'kö |
|  | catanita, panchana | kü'tü'tcü |

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[8] As elsewhere among aboriginal peoples, onomatopoetic terms are of frequent occurrence among the Cayapa, the tendency being especially noticeable in bird names. Terms of this kind in the above list are indicated by means of (o) following them.

**3: Barrett E-5 (1908-1909)1925**
**SD6 Cayapa SD6**

136
192

| English | Spanish | Cayapa |
|---|---|---|
| parrot (large green) |  | lö'rö, alö'rö |
| parrot (small green) | catalina | kšš'' bötci |
| macaw |  | a'kara |

### REPTILES AND AMPHIBIANS

| | | |
|---|---|---|
| boa constrictor | guaicauna | hörtihä'rö |
| boa constrictor | soberecama | we'rä |
| alligator | lagarto | e'mbä |
| crocodile | caiman | e'lmbä |
| crocodile, young | talisio | di' f'rä |
| iguana | iguana | ara''pä |
| lizard (large species) | piande | bämbä'ka |
| lizard (large species) | lagartilla | diandä'la |
| lizard (chameleon-like) |  | kapäitckä'rün |
| salamander | salamanca | waapä'ni |
| tree-toad or frog |  | pa'lata |

### FISH

| | | |
|---|---|---|
| shad | sabalo | awi'li |
| sting-ray |  | pöpä''pä |
|  |  | tyä-wi'li |
|  | verugato | anbra'ma |

### MOLLUSKS

| | | |
|---|---|---|
| oyster | ostion | osti'li, ostedi'a |
|  | pianqua | pi'añgä, kapia'ñgäa |
|  | chiripiangua | tci'ripiañgäa |
| periwinkle |  | ha'kä |
|  | almeja | tcä'ya |

### CRUSTACEA

136
182

| English | Spanish | Cayapa |
|---|---|---|
| crayfish | camaron | a'bītā, pī'tā |
| crayfish (another species) | | karna da (?) |
| crab | cangrejo | od'lā, od'lā |
| crab (a particular species) | | topāl od'lā |
| crab (a particular species) | | kain od'lā |
| crab (a particular species) | | kain'pa odlā |
| | mapara | ma'para |

### INSECTS

Many species of insects abound in the Cayapa region, though few of them directly concern the Indians in an economic way. In view of the fact that many of these insects are not mentioned later in these pages, it seems appropriate to enter more into detail at this point respecting certain of them than was necessary in dealing with plants and animals. 136

Among the insects worthy of particular mention are certain malevolent ones, such as centipedes, scorpions, tarantulas, ticks, stinging gnats and, above all, the mosquito, of which there are a number of species. Contrary to the conditions in many parts of the tropics, however, there seems to be a total absence in the Cayapa region of the yellow-fever bearing species of mosquito, as there is also of the plague-bearing flea. Hence this particular section of the tropics to the present time has been entirely free from these two dreaded maladies, 136
104

136
169

though both exist at various other points along the western coast. There appears to be no particular lack of hosts for either of these insects; and from the fact that the yellow-fever mosquito does exist at Tumaco, only a short distance north of the mouth of the Rio Cayapas, one is at a loss to account for its absence from a region so close as Esmeraldas province where climatic conditions are similar. In the case of the flea, however, at least one possible explanation appears, namely, the difference in climate between the Esmeraldas region and that of the vicinity of Guayaquil. At Guayaquil and southward the coast is comparatively arid, thus giving favorable dry breeding places for the flea, while from Esmeraldas northward the rainfall is very great, consequently the ground is thoroughly saturated and the breeding grounds of the flea are greatly diminished, if not altogether lacking.

Of the mosquitos which do exist here the most dangerous are those of the one or more species which are said to transmit malaria—the "tropical" or "jungle" fever as it is commonly called. Fortunately these pests appear not to be very numerous; at least the cases of "jungle" fever among the Indians, as also among the whites and negroes, are not numerous. Probably a certain degree of immunity is experienced by natives and old residents, for as a rule they have comparatively light attacks of the fever, though often a newcomer is violently infected and sometimes with fatal results.

Another annoying species of mosquito is a small one, the bite of which produces a local infection which slowly

spreads if not promptly checked. The remaining species, 136
of which there are several, are also annoying, but their 164
bites appear to produce no particularly evil effect.

The tick is found only about the mouth of the Rio 136
Cayapas and elsewhere along the immediate coast. This annoying insect is said to be almost exclusively confined, in this region at least, to those sections where domestic animals, particularly cattle and horses, are kept. Thus the Indians, by virtue of their location, are little troubled by it, though much annoyance is experienced by others living where it occurs at all abundantly.

Centipedes, scorpions, and tarantulas are encountered only occasionally, but their bites and stings cause considerable trouble now and then. The centipedes are the most numerous and are of large size, reaching a length of fifteen inches or more. There are also certain other poisonous insects not known in temperate regions, but these appear to be rare.

Among the malevolent insects which do not injure man directly are the termites which destroy woodwork and even extend their tunnels into the dwellings. The damage they do, however, is never considerable.

There are many species of ants in this region, the most of which are quite harmless. One, however, the so-called army, or driver, ant is of importance, though it must be regarded quite as benevolent as it is malevolent. This species travels in great armies, as the name implies. It is strictly carnivorous, and will attack almost any living animal, whether large or small.

136 [578] It is claimed by the Indians that if an army of these ants enters the dwelling, there is but one recourse, namely, its occupants move out and visit nearby relatives or friends for a day or two. Meantime the ants penetrate every nook and corner of the house from top to bottom, including the palm-leaf thatch, and devour or drive out every living thing in it. Cockroaches, one of the greatest pests of the region, are almost always present in large numbers in the thatch, but after a visitation of army ants, they, together with the centipedes, scorpions, and all other forms of insect life have disappeared.

While residing in the cane-mill previously referred to (pl. VI), a short distance above the village of Punta Venado on the lower course of the Rio Cayapas, at about ten o'clock one morning there appeared on the ground about the house a large number of these ants. On investigation it was found that they were issuing from the jungle in myriads, traveling along an old and fairly well-beaten Indian hunting trail that led from the jungle out into the clearing. The cane-mill was surrounded by a clearing of about two acres, with a relatively open portion, about half an acre in extent, immediately adjacent to the mill. The cane, which had been recently planted in this area, did not exceed a foot or so in height, hence a good opportunity was afforded to observe the movements of the ants. To all appearances they paid attention to nothing except their journey, so long as they were on the trail within the jungle; but immediately they reached the edge of the clearing, the dense line, which was as wide as the trail

would permit, broke into several smaller lines which |36
deployed in various directions as the ants commenced their hunt for food. This hunt was thorough to a degree, and involved searching every nook, corner, and crevice of everything they encountered. While thus hunting, the ants passed in large numbers around and under the cane-mill, but for some unknown reason, and much to our relief, they did not climb the houseposts and overrun the mill itself.

A species of small red land crab is very abundant throughout the region. Many of these crab burrows were seen in the vicinity of the cane-mill, which gave
6. an opportunity of observing the attacks of the ants upon the crabs. The scene about the mill during one of these attacks was so animated that it was scarcely possible to keep watch of any particular crab burrow and thus observe the ants as they besieged it. The observer became aware of their presence there, however, when the rightful owner of the burrow suddenly emerged from its entrance and scuttled away in vain endeavor to rid himself of his tormentors. Running first one way, then another, in his attempt to escape, the crab soon found that, while he had been attacked in his burrow by from half a dozen to perhaps a score of ants, each of which clung tenaciously, the farther it ran the more of the enemy it accumulated, until it was finally overcome by sheer force of numbers. Now and then, of course, a crab managed to escape.

Perhaps the most striking instance of the methods employed by these ants in their foraging was given by

136 their ransacking of a heap of old crushed sugar-cane stalks, commonly spoken of as "cane-trash," which lay in front of the mill. To all appearances this refuse pile was not inhabited, but when the ants commenced their search of it, it proved to be literally alive with land crabs and with insect life of various kinds. As a rule, these occupants which succeeded in reaching the surface of the pile, did so in each case with several ants clinging tenaciously to them. Now and then one of the flying creatures, such as a cockroach, would endeavor to escape by means of its wings, but would usually alight within a few feet in order to try to rid itself of the clinging ants, but it usually found that these efforts were rewarded only by an attack of a larger number of the pests.

After two or three hours of hunting and feasting in this clearing, the army of ants took its way up the river-bank and disappeared into the jungle, leaving no trace of its visit save an empty crab-shell or other mute reminder here and there.

[136] Many stories are told by the Cayapa and others of the work of these ants, some of them tending to show what may be regarded as a certain degree of sagacity on the part of the ants. That they work in unison in their attacks on small animal life is shown by the above personal observation, and this fact may be taken as in a measure corroborative of the following experience of Señor Don Calixto Ramírez, who has resided for many years in this region and who has had excellent opportunities for observing its natural history.

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

Shortly after Señor Ramirez's arrival in this section of Ecuador, he had occasion to be out looking up cattle, in company with a friend who at the time was an old resident. They were on the upper course of the Rio Santiago, and in riding along they observed a line of army ants so moving as to indicate that they formed a segment of a circle, the remainder being hidden by the jungle. The two observers tied their horses a short distance away and followed the ants, as the circle moved inward, until they reached a point where the center of the circle was visible. There they saw, to their surprise, a coiled equis, the most venomous snake of the region. The serpent was perfectly quiet, and apparently asleep. The ants moved continually in until their circle enclosed a space of but a few feet in diameter. At this juncture four or five ants approached the equis and finally bit it, thus causing the snake to bestir itself. It moved off toward one side of the circle of ants, where it met a warm reception; it then raced in another direction, with no better result; and so it darted in various directions in its frenzied endeavor to escape, until finally the circle closed in completely, when nothing was to be seen but a writhing mass of ants and the snake, a foot or so high and two or three feet in diameter. Time did not permit the observers to witness the disposal of the snake, but on their return, a few hours later, there was not an ant in sight, but as an evidence of the combat, the snake's skeleton, picked absolutely clean, lay at the point where it met its fate. 136

There are also many other kinds of ants, among which

135 may be mentioned at least one species of leaf-cutting ant whose peculiarly spiny body presents an interesting appearance, though it is in no way of special importance
525 to the Indians. One very large, black, stinging ant, called conga in Spanish, and nyü'mi in Cayapa, is much feared by the Indians and others resident in this region, for the reason that its sting produces not only an annoying local irritation, but also a rise in the temperature of one bitten, so that it is commonly said that the sting of the conga insures two days of fever.

225 Certain species of small bees are of value to the
136 Indians, particularly in the production of the wax used
237 in calking canoes and pottery, and in painting canoes;
278 it is also employed remedially to a slight extent as a
[illegible] cure for cuts and abrasions. The honey made by these bees is very little sought as a food, and is quite secondary in value to their wax. The Indians recognize four classes of these bees. The paha ta'ndą is a small black species that lives in trees and makes the best wax which is yellow in color and is produced in larger quantities than that made by any of the other bees. The cibemi'shi, also a small black bee, lives in the ground and produces an inferior black wax which is used only to a limited extent by the Indians. The third of these small black bees is the ta'nda, which lives in trees but which produces much more honey than wax. The fourth species, amdi a'ma, is a small yellow bee which likewise lives in trees and produces a black wax that is used to a considerable extent.

136 Certain insects are employed as food. Two of these,
[illegible]
[illegible]

which were observed, were a large, black, beaked beetle 136
(*Rhynchophorus palmarum*), called kü'perä by the 625
Cayapa, and a large white larva called kümu'chä by them. 842

Certain other insects, though of no special economic 136
importance, are of interest to the Indians. One in 625
particular is a large beetle (*Euchroma goliath* L. & G.) [806]
whose iridescent wing-covers are employed in making necklaces. There are also large, beautifully colored butterflies, dragonflies, and a large firefly (*Pyrophorus pellucens*), besides a host of other species of insects of greater or lesser interest.

*Insects* 136
192

| English | Spanish | Cayapa |
|---|---|---|
| beetle (*Rhynchophorus palmarum*) | | kü'perä |
| beetle (*Euchroma goliath* L. & G.) | cucaron | kaka''tsä |
| firefly (*Pyrophorus pellucens*) | | mü'hükä |
| lice | | [illegible] tu'nla<br>[illegible]<br>tu'nla<br>[illegible] |
| ant (a large, black, stinging ant) | conga | [illegible] |
| larva (a large white larva) | | kü'muchä |
| larva | [illegible] | [illegible] |
| a worm or caterpillar | [illegible] | [illegible] |

MINERALS

Among the natural resources of the country should 135
be mentioned its minerals, certain of which are found

135 in considerable deposits along this portion of the coast of Ecuador. In fact this region, like a large part of the western coast of South America, is rich in precious metals, those present in this particular locality being chiefly gold and platinum, although silver and copper are also found. It is an interesting fact that platinum first became known to the civilized world through its introduction from the Province of Esmeraldas; it had, however, been discovered and employed to a considerable extent in the making of ornaments by the aboriginal inhabitants of the region about the mouth of the Rio Santiago before its introduction into the modern arts, in fact long before the coming of Columbus. The high development reached in the art of metal-working by the ancient inhabitants of this section is shown particularly by the elaborate and delicately wrought ornaments of gold and platinum, and occasionally also of silver and copper, found so abundantly at La Tolita near the mouth of the Rio Santiago and at certain other points in that vicinity.

325 The Cayapa Indians of the present day are quite differently disposed toward metal-working, for they have no knowledge of the art, now using no metal [416] objects other than those obtained by trade, such as axes, adzes, and machetes. They assert that they never [179] came into contact with the ancient metal-workers of this region, for the reason that they were long ago driven out or exterminated by another tribe which the Cayapa in turn banished in comparatively recent times. Not 326 only do the Cayapa do no metal-work themselves, but

they have no knowledge of mining and are not at all 316
inclined to acquire such knowledge even though they
realize that gold and platinum command good prices
at the settlements. Furthermore, they are extremely 609
distrustful of and even hostile to everyone connected with mining or prospecting enterprises.

### Health Conditions

Associated with the natural resources of a region are 164
its health conditions, which in the Province of Esmeraldas are very good in comparison with most parts of the South American tropics. In fact the Esmeraldas shore is reputed, on good grounds, to be the most salubrious territory of the entire western coast of South America. Indeed, during the entire time spent by the author in the region, there was not, so far as could be learned, a case of any of the ultra-serious contagious diseases, and certainly none was reported in those portions of the province in which he resided. During the same period, however, both bubonic plague and yellow fever broke out with marked violence at Guayaquil, about two hundred miles southward, and there was also an epidemic of yellow fever at Tumaco, not more than fifty miles to the north along the coast from the mouth of the Rio Santiago. As pointed out in speaking of the insects of this region, neither the plague-bearing flea nor the yellow-fever bearing mosquito are found in the Province of Esmeraldas, hence the absence of these two diseases.

The most serious, and in fact practically the only serious, contagious disease of frequent occurrence in

164 this section is a form of malarial fever locally called paludismo; but this malady is so mild in comparison with the diseases above mentioned as to be almost negligible in a comparative consideration of the general health conditions of the region. The attacks of paludismo on newcomers are often severe, and now and then result fatally, but a native or an old resident of the region is usually fairly immune from it.

It is said that typhoid is entirely unknown; indeed no signs of it were observed during the author's stay in the region. Dysentery, which is such a serious malady in certain parts of the tropics, is little known here, though sporadic cases occur; in fact, two cases came under the author's observation, but only one of these was fatal, and this largely by reason of a complication of conditions combined with inadequate care.

It may be said, therefore, that the region inhabited by the Cayapa, and in fact the whole Province of Esmeraldas, is very healthful in comparison with other parts of the tropics.

### Surrounding Peoples

186
197 The only people at present known to have close linguistic affinity with the Cayapa are the Colorados of the upper course of the Rio Esmeraldas. Dr D. G. Brinton[19] places the Cayapa in what he terms the Barbacoan linguistic stock, taking that name from a people formerly living on the upper Rio Patia in south-

[19] Brinton, The American Race, pp. 196–199, New York, 1891.

ern Colombia. Brinton's limits of this linguistic stock are not very clearly defined, but are given roughly as extending from the headwaters of the Rio Daule, which empties into the Gulf of Guayaquil, northward to the vicinity of the Rio Patia, which empties into the ocean north of Tumaco in southern Colombia, thus extending from about one degree south to two and one-half degrees north latitude. The information at Brinton's disposal did not enable him to locate exactly the various peoples which he includes in this stock, but he names the Barbacoas, Cayapas, Colorados or Sacchas, Cuaiqueros, Iscuandes, Manivis, and Telembis. It is not at all unlikely that the peoples whom Brinton calls Barbacoas, Iscuandes, Telembis, and perhaps also the Cuaiqueros, are in reality only small bands of Cayapa who had gone into the localities which still bear these several names, and that the vocabularies and other information on which he based the classification were collected from them at these places, with the result that these people came into literature as four distinct divisions.[11] The same thing has happened in many instances in North America,

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[11] It is highly probable that the meager vocabularies on which Brinton based his classification of these several supposedly distinct groups of people under the one family name were recorded by various systems of orthography, used by travelers whose mother tongues were different, and who in most, if not all, cases were not trained in the study of aboriginal languages. This would be sufficient to account for the considerable differences in the vocabularies—differences which, in the absence of further data, would warrant anyone in considering the various peoples as dialectically distinct one from another.

101 hence it is now being found that a people speaking a
197 single language appears in literature under several different names. As already pointed out, a few of the Cayapa at the present time are scattered along the coast from a point north of Tumaco to some distance south of Esmeraldas. These small bands near the coast are far more accessible to travelers and naturally would be encountered first by them. Hence it could very easily have happened that the several different peoples reported to Brinton, probably by as many different travelers, as separate groups, but whose languages proved to be closely related, were simply these bands of Cayapa who were then, as they are now, living apart from the main body along the Rio Cayapas. Furthermore, if the above assumption is true, it is probable that these Cayapa of the coast then recognized, as they do now, their identity with the main body of the people.

[103] The fact that almost all the rivers, and especially all the smaller streams, as well as other physiographical features of the whole region, mentioned by Brinton, still bear names that are of Cayapa origin, is strong evidence that the Cayapa at a comparatively early date had spread over this large area and that they were familiar with and probably in possession of, so far as other Indians were concerned, the territory from a point some distance north of Tumaco southward. It therefore seems very probable that what appeared to Brinton as several linguistically related groups are in reality parts of a single group, and that formerly, as now, the only other people so far reported who have any

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6
Colorado SD7

close linguistic affinity with the Cayapa were the Colorados.

CA
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The dialect of the Colorados, however, is so different from that of the Cayapa as to be almost unintelligible to the latter. Their customs, dress, and general culture are also quite distinct, and their territory is of a very different character from that of the Cayapa, being decidedly mountainous, though not far enough inland to be at a great altitude. There is no political or social affinity between the two peoples; in fact, although belonging to the same linguistic stock, the only knowledge one has of the other is that gained from an occasional visit by two or three Cayapa to the Colorado country, or vice versa. It is told as one of the important events of recent times that in returning, several years ago, from a visit to Quito, the chief of the Punta Venado division of the Cayapa came by way of the Colorado country and spent several days there, and that he finally brought home with him a member of that tribe who visited on the Rio Cayapas for some days before returning to his own people.

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That the Cayapa have wider linguistic affiliations has been recently shown by Drs Beuchat and Rivet,[12] who set forth the fact that there is considerable affinity between the Barbacoas, of which the Cayapa is a dialect, and the Coconuco and Paniquita groups, both of which are in Colombia. The interrelations of the latter two

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[12] Affinités des Langues du Sud de la Colombie et du Nord de l'Équateur (Groupes Paniquita, Coconuco et Barbacoa), par H. Beuchat et P. Rivet, extrait du *Muséon*, Louvain, 1910.

Cholo

197 groups are much closer than are those of either with the Barbacoa, but there seem to be a sufficient number of features in common between these two Colombian stocks on the one hand, and the Cayapa and Colorado dialects on the other, to warrant the inclusion of all these in a larger group or linguistic family.

101 On the north the nearest Indian neighbors of the Cayapa are those commonly called by the ambiguous term "Cholos," and who live along the Rio Saija, a small stream which empties into the ocean at about 2° 50′ N., at a point nearly opposite the island of Gorgona. These people are entirely different from the Cayapa in language and culture; but there is a certain amount of intermingling between the two, and a marked [177] influence is exerted by the Cholos on some features of Cayapa culture, especially medicine practices.

The only other Indian neighbors of the Cayapa are the Quichua, or Kechua, descendants of the historic Inca peoples, who live in the interior valleys, the nearest being those about Ibarra and Cotacachi. Although [484] they are of an entirely different linguistic stock, there is here also a certain amount of intermingling, small parties of Quichua making occasional trips down to the coast, and small parties of Cayapa making occasional trips into the mountains. At the present time, however, [487] the trails are much neglected and are extremely difficult to travel, so that the intercourse is very slight.

177 The only other peoples with whom the Cayapa come into contact are the few European or North American whites, and the many negroes, descendants of former

slaves of this western coast, especially of Colombia. 177
These negroes live adjacent to and mingle very much
with the Cayapa, and have exerted a strong influence [533]
on some features of their culture, especially their music.

## HISTORY

According to Cayapa tradition, the original home of 173
the people was in the mountains near Ibarra. At a time probably very near that of the advent of the first Spaniards, the Cayapa as a body moved to what is now known as Pueblo Viejo de Cayapas, in the mountains drained by the upper course of the Rio Santiago. Various reasons are given for this migration, some affirming that it was because of their fear of the invaders (and, as one informant said, especially the fear of their horses), while others say that it was due to the general alteration in their mode of life as a result of the conquest. Still others claim that the migration occurred some time prior to the conquest, and that it was due to their love of peace and their distaste for the hostilities forced on them by the invading Quichua, or Incas as they are so often called, who, only a comparatively short time prior to the arrival of the Spanish explorers, had invaded Ecuador and subjugated its various peoples in the interior, even as far north as what is now the northern boundary of the republic. One informant related a traditionary tale to the effect that the Cayapa migrated by the advice and under the leadership of a certain shaman who, dissatisfied with conditions as they were at Ibarra, called through his magic a jaguar which he entrusted with the duty of finding a more suitable abode. After

173 about a month's wandering, the jaguar returned and reported to the shaman that the most suitable place was the then uninhabited region about Pueblo Viejo. Acting on this advice he assembled his people and all departed for the new locality. Here the Cayapa lived for a considerable length of time in much the same manner as before—typical mountaineers, knowing very little of river life, and with maize as their staple food.

At that same time the rivers Cayapas and Santiago, and the coast adjacent, were occupied by another people, very vicious and always enemies of the Cayapa. By some they are said to have been cannibals. They preyed constantly on the Cayapa, killing them whenever and wherever encountered. The Cayapa, on the other hand, were then, as they are now, a very peaceable people; but after many years of these outrages they organized war-parties which descended the rivers and exterminated the enemy. These people are always referred to by the Spanish term *Indios Bravos* ("wild Indians"), and are described by some informants in fanciful, mythical terms. By most, however, they are declared to have been like ordinary people, except that both men and women wore skirts of bark cloth and otherwise dressed differently from the Cayapa, and that they were very ferocious. Some claim that in this war of extermination all these Indios Bravos were killed; others claim that a few escaped to the mountains about the extreme headwaters of the Rio Esmeraldas, where their descendants still live and are much feared even at the present time.

It is said that these people whom the Cayapa are reputed to have conquered are not the people who formerly lived at La Tolita and built the mounds and made the pottery and metal objects so abundant there. That was a still different tribe which occupied the region prior to the time of the people whom the Cayapa exterminated. And they are likewise quite a different people from those formerly living along the lower course of the Rio Esmeraldas. It is said that at a point on this river a short distance above the present town of Esmeraldas, there lived, before the coming of the whites and negroes to the region, a tribe of Indians called Wásũ. They were like the Cayapa in appearance, but had a language entirely different from that of the Cayapa or of any people now known to them. It is said that there were a few of these Indians in the vicinity of Esmeraldas up to within a generation or two past, but that they are now extinct. No words of their language were recalled by any of the Cayapa informants.

Accounts of the migration of the Cayapa from Pueblo Viejo to their present abode vary somewhat. One informant gave the following account which attributes the success of the Cayapa to magic.

After the Cayapa had been subjected to the depredations of the Indios Bravos for many years, it was determined that some action must be taken to insure their safety. Accordingly three men were sent out to reconnoiter. They came down the river on a small raft, using the greatest care to make no sound and traveling entirely at night. They reported that there were

173 great numbers of the Indios Bravos living in villages along the river.

Next, two young women were sent down, who at last discovered a house containing two Indio Bravo men asleep. Approaching cautiously, they discovered that these men held clasped very tightly under their arms short lance-shape wands which, by working with the utmost caution, the women were able to remove. They took these objects back to Pueblo Viejo and gave them to their husbands, who set about at once to learn from the wands the various magic, death-dealing powers which they possessed. At first the wands refused absolutely to divulge anything, but after being frightened with threats of burning, they consented to teach the men during the night.

When night came, therefore, the wands flew about the house and exhibited their magic power. They taught the men what parts of the body were vulnerable to them, and how, on the other hand, they might be caught in the arm-pit, by the side of the head, on the shoulder, in the inner angle of the elbow, in the angle of the knee, and by various other parts of the body. The wands also taught these men how to dodge their own attacks, and also how they might be used in killing the uninitiated. These men, in turn, taught others, until a considerable company of magicians had been thoroughly trained.

At last an expedition of ten of these magicians, each with his wand, which had been thoroughly tried, started down the river to attack the Indios Bravos. One magician, who was especially powerful, remained in his house at Pueblo Viejo to chant the proper incantations to pacify the souls of those who were to be killed, in order that they might not harm any of the attacking party of magicians. The members of the party approached in succession and with great caution the various points inhabited by the Indios Bravos. At each place they made a sudden attack, using their wands with deadly effect. These attacks were met by a stout defense on the part of the Indios Bravos, but the wands of the Cayapa had been so thoroughly trained and proved that they were able to fly against those sent by the enemy and break them, and later to kill everyone in the village attacked.

The Cayapa first attacked the Indios Bravos living along the Río Sapayo Grande; next those along the Río San Miguel; next those along the Río Camarones; then those along La Herradura de Cayapas, and so on down the Río Cayapas, up the Río Onzole, and again down the Río Cayapas to its confluence with the Río Santiago. They also visited destruction on the inhabitants along the Río Santiago, and finally made their way down to the coast. Here the magicians divided part going along the coast as far as Tumaco on the north the remainder going as far as Esmeraldas on the south Thus by these magic means they were able to destroy all the former inhabitants of the region and to render it habitable to themselves.

On the return of the shamans to Pueblo Viejo, all the Cayapa moved down to the Río Cayapas, which region

173 in large measure they found to be the same as it is now; but the Cayapa did not take possession of the former territory of the Indian Bravos until conditions had first been more or less changed. For instance, while the Indian Bravos had fields of plantains and bananas as do the Cayapa at present, they were not utilized directly by the conquerors, but the roots were dug up and replanted. Similarly all other products of the labor of the Indian Bravos were changed, thus removing any danger to the Cayapa from using them.

[2[illegible]] In those days also, the sabalo, the fish most prized by the Cayapa, existed only in the main streams of the rivers: it never came into the small esteros as it does now. On going into the country of the Indian Bravos the Cayapa placed near the mouth of each estero a row of palm-wood posts which had the magic power of rising from the ground to their full height during full moon and of sinking into the mud out of sight during the dark of the moon. These posts are said to have had a direct effect on this particular species of fish and on their passing up and down the esteros. Some of these posts are said to be found even now at the mouths of certain esteros.

173 There are, of course, no means of fixing the exact
174 date of the migration of the Cayapa either to Pueblo Viejo or to their present location, and their tradition cannot be taken too literally. However, it seems probable that the essential features of the tradition in large measure are based on historical facts.

Whatever the reasons for their move, and whatever

the means employed to accomplish it, the advantages 173
in this new location over their former mountain habitat
resulted in greater ease of agriculture, improved con- 174
ditions for growing plantains, facility of travel on the
river, and proximity to the sea. The change from their
former life, which was that of a village community of
mountaineers with maize as the staple food, was very
considerable. They at present live scattered along the 361
banks of the rivers, each family keeping to itself in
large measure, but they still preserve a semblance of [57]
their former village life in the three pueblos, Punta
Venado, Sapayo Grande, and San Miguel, each of which
is a common meeting place for its particular division
of the people.

The provincial and national governments recognize, 648
in a way, the rights of the Indians to full and peaceable possession of their territory, and have endeavored to protect them by enacting laws prohibiting the settlement of other peoples along the Rio Cayapas and its tributaries. The enforcement of these laws, however, has been quite another matter, for the negroes, descendants of former slaves of Colombia and Ecuador, in later years have gradually worked their way up the streams until now their houses extend as far as Corriente Grande. Formerly Cayapa houses were found as far down-stream as Borbon, at the confluence of the Cayapas and Santiago rivers, but at present the house farthest down-stream is only a short distance below the confluence of the Rio Onzole with the Rio Cayapas.

As for the white population of the entire Province of

648 Esmeraldas, and especially of the drainage of the Rios Santiago and Cayapas, it is decidedly in the minority; indeed at present there is only one white family living on the course of the Cayapas.

The desirability of the intrusion of another race into a territory occupied by Indians is always doubtful. In this case it is especially so, for some of the negroes at all times take great liberties with their Indian neighbors, not to mention the fact that they openly plunder their crops and houses whenever opportunity offers. These depredations the Cayapa tolerate, rarely taking a hand themselves in the punishment of the offenders, and never committing acts of reprisal. They are a law-abiding people, and recognize completely the authority of the provincial government over all inhabitants except themselves. 627 Any such acts, if they were to occur among themselves, would be severely punished in their own way and without governmental aid. Be it said to the credit of the provincial authorities, that they recognize the right of the Cayapa to govern themselves and to punish their own offenders, and further that they attempt to protect the Indians from impositions by others. However, it frequently happens that the guilty ones either escape or, if apprehended, are inadequately punished.

628 674 As above mentioned, all ordinary depredations, such as theft by outsiders, are tolerated by the Cayapa without personally attempting to punish the offenders. There is one crime, however, which demands a severe penalty, namely, outrages against women. The standard of

ethics is very high among the Cayapa themselves, and 678
any case of unfaithfulness, if such were to be discovered 679
among themselves, would be most severely dealt with. About 1897 or 1898 two negroes came to a Cayapa house, drove the men away, and took possession of the premises with the women occupants. On the following day the chief sent down the river a commission which conveyed to the local teniente politico at La Tolita the heads of the negroes, carefully wrapped in leaves of the hoja blanca, as well as the compliments of the chief, and with an explanation as to the reason why the heads had been separated from the bodies. Incidentally the explanation conveyed the intelligence that future offenses of this kind would be punished in like manner. The teniente politico was requested to forward to the governor at Esmeraldas the two heads and the above message, but owing to the rapidity of decomposition in the tropics, it was deemed best to give the governor the benefit of the message only. Fortunately for all parties concerned the governor's reply, it is said, was a complete vindication of the action of the Cayapa. So far as could be learned, no similar crime has been committed since that time.

## DAILY LIFE

The social organization of the Cayapa has a strictly 361
family basis, although according to their own traditions 592
they formerly lived, when at Ibarra and Pueblo Viejo, in village communities. At present each family regularly lives entirely separated from every other family, and usually at a considerable distance from its nearest

361 neighbor, though occasionally two or three houses may
592 be within sight of one another along the river. In no
[592] case, however, is there an approach to communal life,
each family forming an individual unit with family
622 property-rights. There is, to be sure, a central government,
626 the head of which is an hereditary chief, or gobernador,
as he is at present called after the Spanish fashion.
The purposes of this central government are strictly
those of preserving law and order, settling controversies
between individuals, and punishing infringements upon
[421] recognized social customs. In no case is there any
interference by the central government with property
or other recognized family rights and privileges.

592 A family, as the term is here used, consists of husband,
[591] wife, children, and dependents. By dependent is
meant not necessarily one who is supported by the
others, but one not having a house and a family of his
own and who may choose to reside with some family,
usually a closely related one. These dependents are
usually newly-married sons or daughters, or are parents,
grandparents, or other relatives of the head of the
house or of his wife.

462 The daily life of the Cayapa is a busy routine for all
592 members of the household, especially the women. In
addition to the cooking, keeping the house in order,
and attending to the wants of the smaller children,
the mother of the household is kept busy spinning,
weaving cloth, and making baskets, mats, fans, and
pots, to say nothing of the work she does in the care of the
crops and the gathering of the wild foods.

At an early age the girls are instructed in household duties of all kinds, and often begin to spin and weave, as well as to make pottery, basketry, and other articles, at the age of five or six years. They also take a hand in agriculture when very small. As they grow older and become more proficient in these various arts, they enter more and more into the regular daily work of the home, until they finally marry, which they usually do at an early age, often at about seventeen or eighteen years. [illegible] [illegible] [illegible]

The daily life of the men is also a busy one. They do their share of the work in the fields, besides being industrious hunters and fishermen. They are expert woodworkers, making very excellent canoes, paddles, benches, images used as toys by children, musical instruments, certain cooking utensils, and various other objects of wood. They make and tend the fish corrals, as well as set the seines when the water is in a favorable condition to divert fish to certain places. In addition to trapping and netting fish, they also do much fishing with hook and line. They hunt a great deal and procure a very important part of the food supply in that way, for the jungle abounds in many kinds of game. When about the house, they are, like the women, almost always busy at something, as adzing a canoe, weaving a net, or doing some one of the many kinds of work which fall to the man's lot in the Cayapa division of labor. Since the introduction of needles and thread among the Cayapa, the men have taken up sewing and have become very efficient tailors for their simple needs. [illegible] [illegible] [224] [illegible]

289 The women do all the spinning and weaving of cloth, but the men sew all garments, not only for themselves but also for the small boys who have not yet learned to sew. This is due largely no doubt to the fact that the single garment worn by the women requires no sewing whatever, while the two garments worn by the men must be sewn. [462]

866. At a very early age boys begin to learn the arts practised by their elders, hence they are instructed in hunting, fishing, woodworking, and similar useful accomplishments of the men.

512 It is customary among the Cayapa to arise at dawn, usually between five and five-thirty o'clock, and to retire as soon as darkness comes, or between six-thirty and seven o'clock. These hours vary little throughout the year, owing to the proximity of the equator.

[527] The daily routine is usually about the same throughout the year, varying in event of a fiesta, or boda, which brings the people together at a particular village, from which, after some days of festivities, they return home. [484] Another diversion is going down the river to the settlements. Sometimes this trip is made almost purely for [439] pleasure and to obtain oysters and other sea foods, but more often these pleasure trips are combined with the selling of tagua, cacao, rubber, or plantains, and occasionally logs for lumber.

593 One of the most characteristic features of the daily life of the Cayapa is the devotion of the members of a family toward one another, especially that of parents toward their children. Few restrictions are placed

upon the children, and punishment is very rarely necessary. The children usually play together amicably, and the considerate care given by elder children to their young brothers and sisters is especially noticeable. 593 855

The agriculture practised by the Cayapa requires a great deal of labor in connection with the various crops, especially plantains, sugar-cane, and cacao. In this cultivation the whole family joins, the children, even when very small, cheerfully doing their share in clearing away the weeds and brush that grow so rapidly in the tropics, and in harvesting the crops. 241 857

The children have various amusements, though no games in the ordinary sense of the term. They have several kinds of toys. Musical tops, such as those shown in pl. LXXXV, 2–5, made of gourds and certain large nuts, are much used. Wooden dolls of various mammal, bird, and human forms, such as those shown in pl. LXXXIV, are also much used. They have toy canoes varying from a few inches to several feet in length, and toy paddles for use with them. These canoes and paddles they use a great deal, especially when swimming, which is a very common and healthful amusement among both sexes. 524 857

The children are trained to this canoe life from infancy, and one of the first toys of a child is a paddle. At a very early age children are instructed in its use, so that even at the age of five or six years a child can take a small canoe and paddle along the river for short distances. 502 868

The children also play with small baskets, fans, mats, 524 857

524 pots, and wooden and stone implements, made by them-
857 selves or by their elders especially for them. They construct play-houses after the fashion of dwellings, and often make small fish corrals like those used by
[41] their elders. The boys also make toy fish-nets and gigs, and still use the blow-gun as a plaything, although this old type of hunting weapon is now rarely used by the men.

The nearest approach to a game among the Cayapa, either among the children or among the older people, is that which the boys play with their musical tops, although this is not at all a game of chance. The floors of the Cayapa houses, being made of undressed palm-wood, are always too rough for the spinning of tops, and the ground is always too wet. Therefore, to provide a spinning surface, a large mat is spread upon the floor, or a manta or other piece of cloth is stretched tightly over the legs of a boy seated flat upon the floor. Then he, with usually another boy, spins the tops in opposition one to another, the point of the play being to see what top can knock the other from the spinning surface. There is no scoring in this amusement, and the whole pleasure of it is derived from the spinning of the tops and especially from watching them collide with one another. Often two boys are able to keep four or five tops spinning at the same time, so that their collisions create a lively scene and furnish much pleasure to the onlookers as well as to those engaged in the spinning. The spinning is usually done with the hands alone, although sometimes, if a very rapid

motion is desired, a string with a grip is used. Occasionally 524
a girl may be seen spinning a top, but it is primarily 857
an amusement of the boys.

## MATERIAL CULTURE

### BUILDINGS

The buildings of the Cayapa may be divided into 342
four classes: the dwelling or regular abode, the rancho
or temporary structure, the cane-mill and distillery, [348]
and the church, this last, of course, being of modern [177
introduction. All these buildings, except the church, 346]
which is at ground level, are pile structures and are
constructed according to a single general plan.

In pls. I-IV are shown typical dwellings. They are always rectangular in ground-plan (pl. XI), and vary in size according to the number of occupants, some reaching large dimensions. The dwelling of which the above-mentioned ground-plan is presented is 87 feet in extreme length and 41 feet in width. Dwellings are almost invariably situated along the river bank, and each is flanked by fields of sugar-cane, plantains, bananas, cacao, pineapples, and other crops. The dwellings [417]
are raised four to twelve feet from the ground, and access is gained by means of ladders such as those illustrated in fig. 1, especially those of the types shown in *a* and *d*.

The houses are fairly simple in construction. The 342
framework consists of a number of heavy squared posts 324
of a hard black wood called by the local Spanish name

342 [420] guayacan, in which notches are cut at the level of the floor (pl. XIII, *b*) to hold the stringers that support it. The tops of these posts are also notched for the beams that support the superstructure. The sides of the

[417]

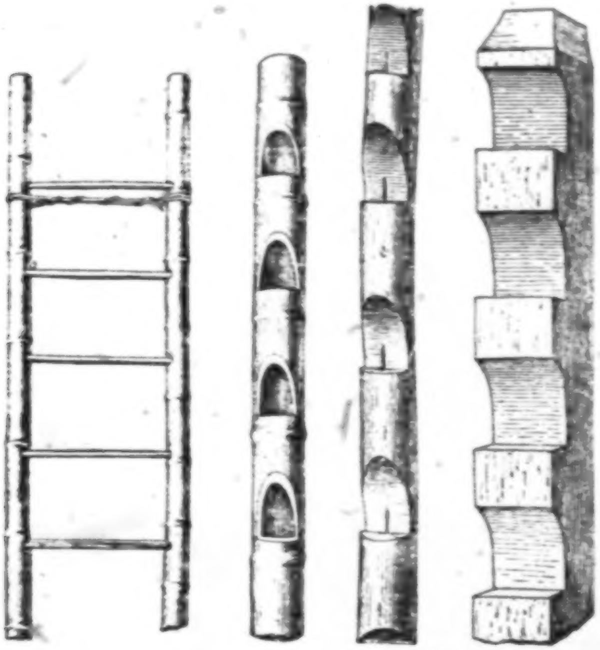
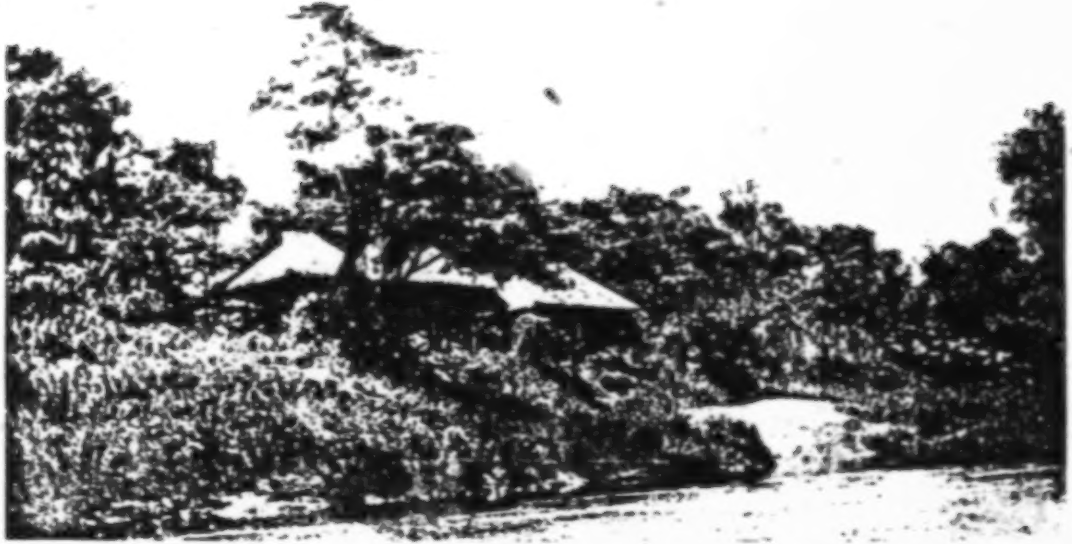


FIG. 1.—Types of ladders

[824] building are entirely unenclosed. The roof is steep and is thatched with palm leaves. Sometimes a single roof covers the whole building, as in those structures shown in pls. II, VII; but upon the larger buildings it is ordinarily in two parts, as indicated in pls. X, XI. While the floor in such a structure is continuous, the presence



DWELLING AND ADJOINING CANE-MILL

[p. 46 (A)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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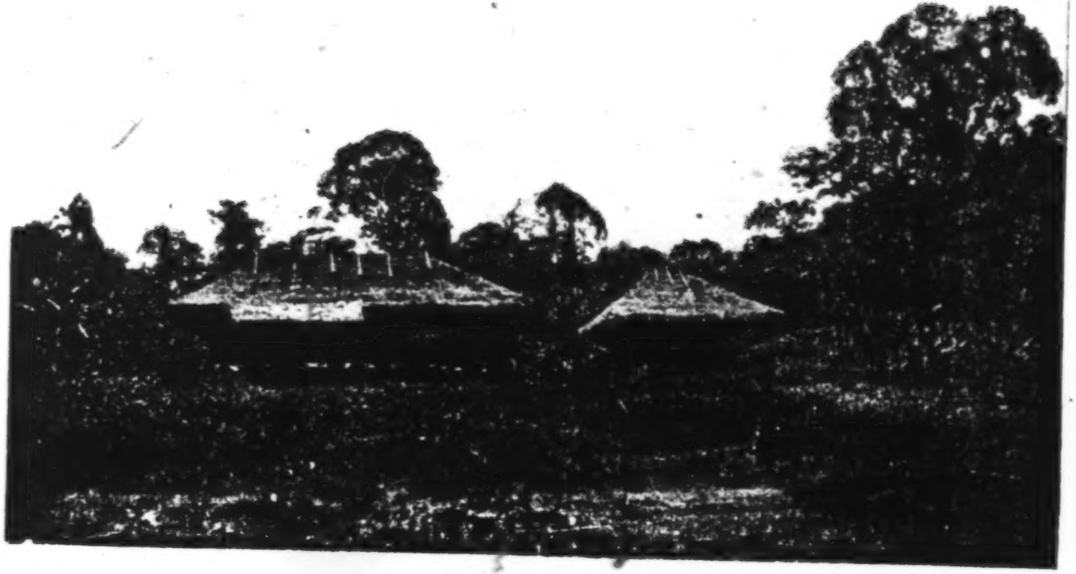
PL. II

[p. 46(a)(B)]



DWELLING SHOWING ROOF EXTENSION AND BAMBOO RIDERS

of these two roofs serves to separate the building into 342
two parts: one for the general living and sleeping room,
the other for cooking. The structure is thus given the
appearance of a double house, although the floors of the
two rooms are always at the same level and the house
is a unit in every respect except the roof. The double [354]
roof serves to exclude the smoke, which rises from the
open fire-box in the kitchen, from the living and
sleeping room. This division of the roof results in two
inner gables, the eaves of which are brought within
the area of the house itself (pl. XI, *h*, *i*) and under normal
conditions would allow the rain-water to fall upon the
floor. To prevent this, a large eaves-trough is made by [324]
hollowing out half of the long trunk of a species of [355]
palm locally called pambil (Cayapa, bū'iñ-tcī). The
roof always projects a considerable distance beyond
the edge of the floor, so that rain-water from the eaves
falls at a distance of at least three or four feet from the
sides of the building, and the eaves extend far enough
down to prevent the wind from blowing the water back
on the floor. As before stated, the ordinary dwellings
have no sides, but their place is partly taken by a more
or less elaborate railing, such as that shown in pl. V, which
lessens the danger of one accidentally falling from the
elevated floor. Raised platforms are frequently constructed at one or more points along the sides of the
building. Such platforms are from four to ten feet in
length and from four to seven feet in width, as are those
shown in pl. XI, *a*. The roof is correspondingly extended
to cover them. These platforms are raised usually

342 from four inches to a foot above the level of the main floor, and are most frequently used as sleeping platforms or as storage places for various articles.

352 In this region where the rainfall is so great and where the sun rarely shines, one of the serious problems is that of keeping clothing and other articles dry. To accomplish this, there is constructed at one side, usually at the rear of the house, or behind that portion in which the fire-box is situated, a drying platform, constructed of large bamboo stems laid side by side, without a roof, and ordinarily on or nearly on a level with the main floor. The convex surface of the bamboo permits the water falling upon it to drain readily to the ground, while the impenetrable outer surface of the bamboo permits no rain to be absorbed by it. Thus, in a few minutes after a rain, this raised platform is usually dry enough to permit the spreading upon it of clothing, or
227] of mats for the drying of cacao. At one side of this drying platform is placed a horizontal bamboo pole, usually as long as the platform and raised six or seven feet above it, for use in drying large fish-nets.

251] On the rafters of the house, and hence high up in the interior, is constructed a platform, or loft (pl. XIV), usually of bamboo, which is used for the storage of old utensils, food, and articles not in daily use. Ordinarily this storage loft does not cover a space equal to more than one-quarter that of the floor of the house itself, and frequently it is much smaller, although always of sufficient capacity to accommodate all the surplus stores of the family.

P. 43(A)

TYPICAL DWELLINGS ALONG THE RIVER

342

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

34.
797

BARRETT—CAYAPA INDIANS PL. IV

PRIEST'S HOUSE AND CHURCH AT SAPAYO GRANDE

[p.48(B)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

In pl. XI is shown the ground-plan of one of the 342
largest of the Cayapa houses. This is the largest of the [622]
four dwellings of the chief of the Punta Venado division,
and is commonly called "*la casa grande del Gobernador*."
This structure is situated on the southwestern bank of
the Rio Cayapas, at a point just up-stream from the
confluence of the Herradura Grande. The house is
occupied usually by at least two families, and can
comfortably accomodate as many as forty people if
necessary. The structural details of this dwelling are
typical of those of Cayapa houses in general, although
the others are somewhat smaller. This "casa grande"
is 87 feet in extreme length by 41 feet in extreme width.
The floor may be divided into two areas by the line
*h-i*, which represents that along which the two inner
gables meet and where the pambil eaves-trough is
placed to prevent the water from running in on the
floor. The larger floor area (*a*) is the general living and
sleeping room, and is 50 by 35 feet, exclusive of the
raised projections (*e*), which extend from six to seven
feet in each case. This entire floor area is covered by a
single large roof. The smaller area (*b*), about 30 feet 342
square, is, as before stated, at the same level as the 252
larger area, but it is covered by a separate roof, and
it is here that the fire-box is situated and where all
food is prepared and cooked. The fire-box (*c*) is 6
feet 4 inches by 3 feet 9 inches, and is raised about three
feet from the floor. The projection (*d*), about 5 feet 252
6 inches wide and 19 feet 6 inches long, is at the same 352
level as the main floor, but is made of bamboo. Here

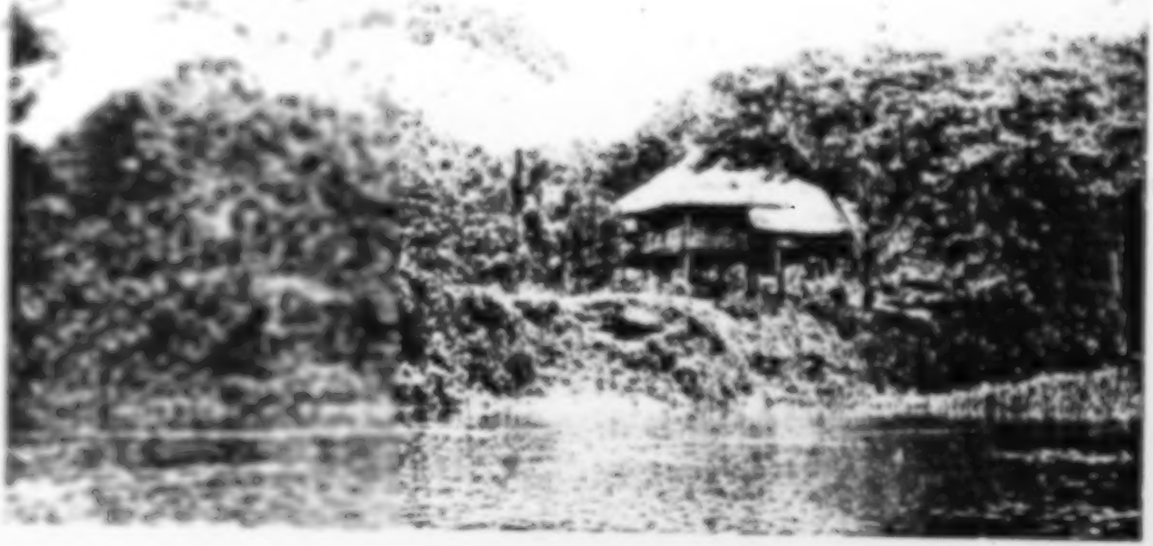
252 are kept the water calabashes, and the preparation of
352 food is usually done on or near this space. All houses
are provided with a similar place for the storage of the
calabashes, although in most cases the space devoted
352 to this purpose is much smaller. Unlike *d*, the several
projections marked *e* on the plan are raised from four
to twelve inches above the level of the floor. They are
from 6 to 7 feet in width, and beginning at the lower
left-hand corner of the plan, measure 12½, 8½, 15, 13,
11, and 9 feet, respectively, in length. These serve as
storage places and are frequently used at night as
342 places upon which to sleep. The inner edge of each of
the areas *d* and *e* is, of course, supported upon the
stringers of the main floor, but the outer edge in each
case is held by two special posts which rest upon the
ground and reach to the roof, which naturally must
project beyond the main roof in order to cover the
corresponding floor projection. These posts are indicated in the ground-plan by small rectangles, and are
usually somewhat smaller than those employed to
support the main floor. As shown on the plan, fourteen
posts are used to support the main floor, the successive
posts along each side being placed from eleven to twelve
feet apart. The dimensions of these posts in cross-section are usually about six by nine inches. Access
to this house is by means of two ladders (*g*), both of the
type shown in fig. 1, *a*. In the case of one of them a
special projection (*f*), 3 feet 3 inches by 5 feet 6 inches,
has been built as a landing at the top of the ladder.

In pl. XIII is shown an elevation of the same house,

3: Barrett E-5 (1908-1909)1925.
SD6 Cayapa SD6

[illegible]

[p.301f]



DWELLING SHOWING RAILING IN LIEU OF WALLS

222
342

f-50a

THE CANE-MILL.

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

The essential parts as shown here are the squared house-post (a), into the side of which is set, by means of a notch (of the type shown in fig. 4, b) a stringer (pl. xxii, b) running lengthwise of the house. Upon this rest the bamboo poles (c) which support the palm-wood floor (d). This floor is at a height of eight feet nine inches from the ground, into which the house-posts are set to a depth of three or four feet. The house-post projects seven feet above the floor level, and at its top is cut another notch (of the type shown in fig. 4, a, and b) into which is bound another long stringer, e, similar to b, and which forms the support for the entire superstructure. A corner of such a superstructure is shown in fig. 5, in which the parts are lettered to correspond with those shown in pl. xxii. In fig. 5 the point of observation is within the house. The longitu-

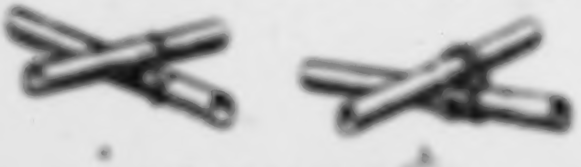


Fig. 3.—Details of frame construction

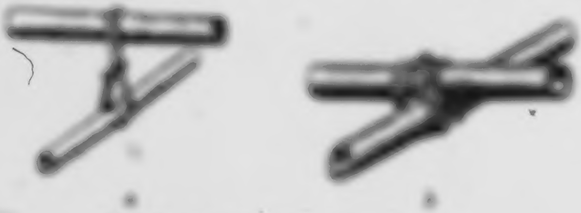


Fig. 4.—Details of frame construction

distal stringer (e) projects three or four feet beyond the house-post, and upon this rests the transverse stringer (f) which projects about the same distance beyond

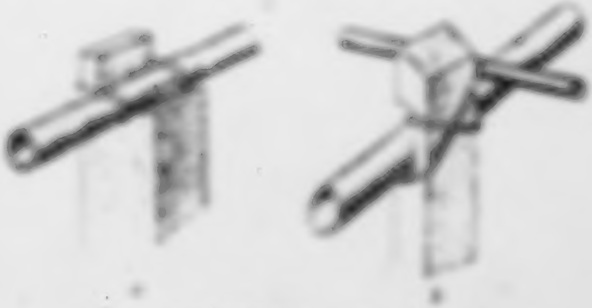


Fig. 4.—Notches for receiving stringers

the former (e). Near the end of this projection rests another longitudinal stringer (g), upon which rest the lower ends of the rafters forming the side of the roof. In some structures the ends of the rafters of the gable

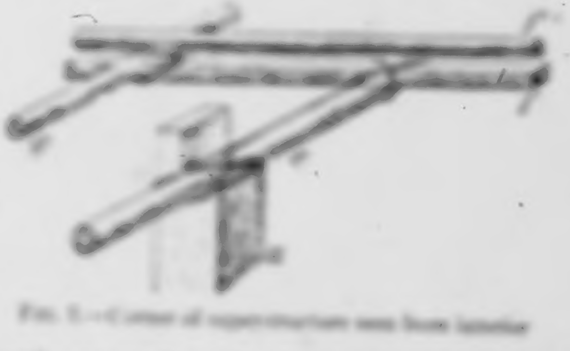


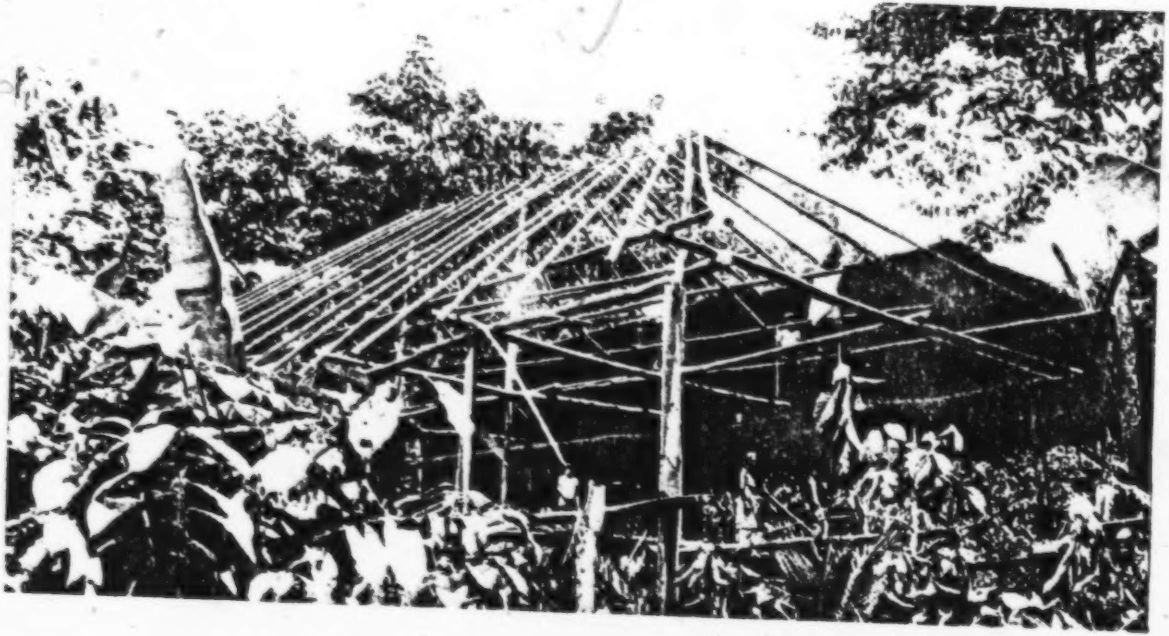
Fig. 5.—Corner of superstructure seen from interior

rest directly upon f, as is the case in the large house above mentioned, an elevation of which is illustrated in pl. XIII and also in the unfinished structure shown

BARRETT—CAYAPA INDIANS

PL VII

p 52(A)



UNFINISHED HOUSE, SHOWING ROOF STRUCTURE

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3: Barrett E-5 (1908-1909)1925

SD6 Cayapa SD6

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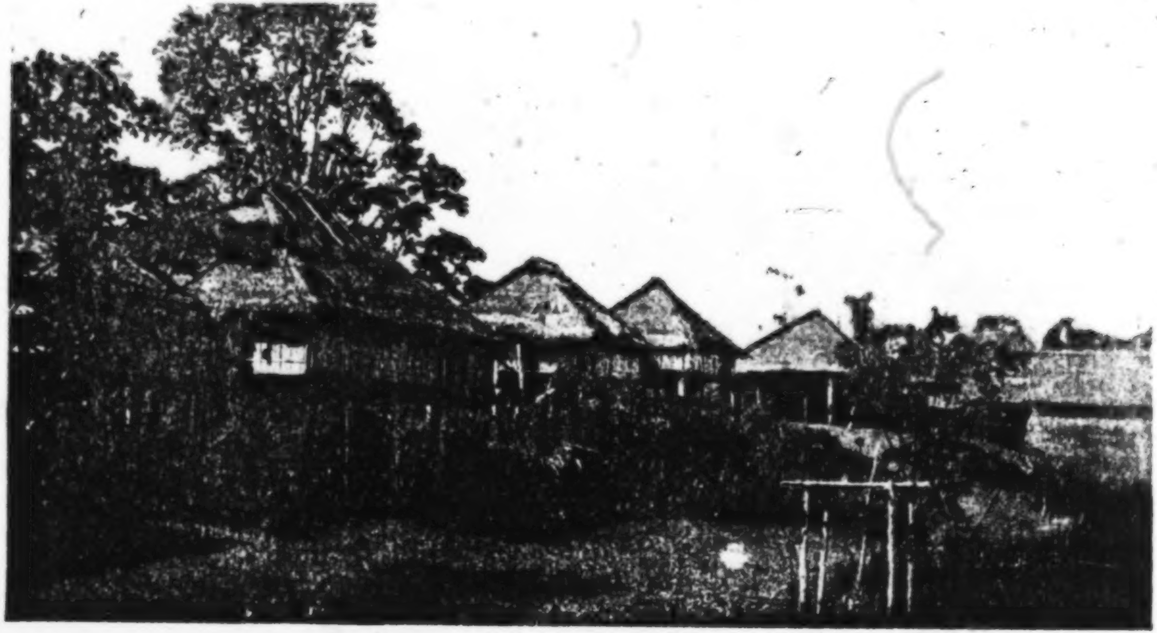
PL. VIII

[p.52(B)]



VILLAGE OF PUNTA VENADO

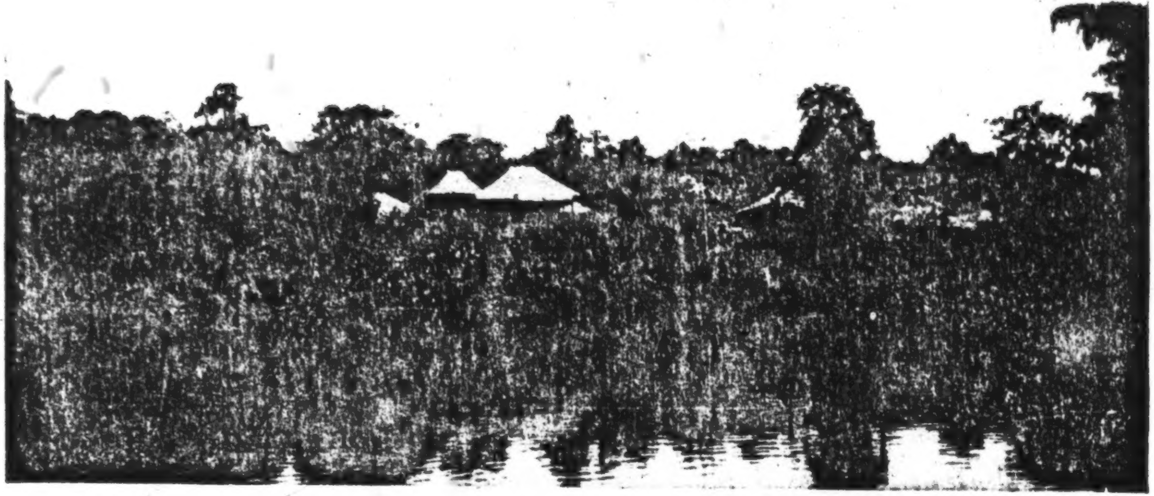
in pl. VII. In some other dwellings another transverse 342
beam (fig. 5, *f'*) is used as the support for the gable
rafters.

In practically all cases in which two such stringers 342
cross or where a stringer passes through a notch in a
post, the parts of such a joint are securely bound together 284
by one or another of the several methods shown in
figs. 2-4. The binding material is a durable aerial [824]
root, called pitigua in the local Spanish, which is gathered
and kept on hand for this purpose and for making
certain kinds of basketry. It is kept in coils such as
that shown in pl. XCI, 4, and when dry it needs only to be
soaked for a short time to render it pliable.

The roof frame of such a building consists of a short 342
central ridge-pole (pl. XIV, *i*), supported by two and
in some cases three stout vertical bamboos (*m*) which
in turn rest upon a horizontal beam (*j*) running lengthwise
through the center of the building. The ridge-pole
is of such length as to give the gable roofs a pitch
of about forty-five degrees. It varies, therefore, according
to the proportionate dimensions of the structure,
but is usually from a third to a half as long as the building
itself. The bamboos supporting the ridge-pole are,
in the case of the large dwelling above mentioned, 13
feet 9 inches in height. The bamboo rafters of the sides
of the roof rest directly upon and are bound to this
ridge-pole. Those forming each gable are fastened
together by means of a palm-wood rod passing through
holes near the small upper ends of the rafters. This 342
rod is bound to the two end-rafters of the sides of the 284

342 [234] roof, usually at a point two or three feet down from the ridge-pole. The other ends of these gable rafters are spread fan-like along the end beam (fig. 5, *f*, *f′*) of the superstructure so as to produce a complete frame for the attachment of the thatch of the gable. There is thus left at the top of this gable a small triangular opening, such as that shown in pl. X, which serves as a vent for the smoke from the open fire-box. The thatch is so laid on that it projects about two feet beyond the ends of the side roofs, while the thatch on the gable end just meets the underside of this projection. The projection of the ends of the side roofs in this manner prevents the rain from driving through the thatch along the line upon which the side and gable roofs meet, and it is also sufficient to prevent the entrance of rain through the triangular opening at the extreme top of the gable. The slant of the roof, both gable and side, is usually about forty-five degrees. The slant of the gable is regulated by the length of the short ridge-pole above mentioned. This whole construction of the superstructure of such a building is well illustrated in the unfinished dwelling shown in pl. VII.

245 824] [342] The covering of the roof is a thatch of palm-leaves, usually those of the tagua, or ivory-nut palm. The necessity for a constant supply of these leaves, combined with the desire to perpetuate the supply of ivory nuts (since these are a source of considerable wealth), has caused the Cayapa to preserve carefully the groves of these palms. Even single palms growing quite apart from others are conserved. The trees, vines, and under-



DISTANT VIEW OF PUNTA VENADO

[p. 51(a)]

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3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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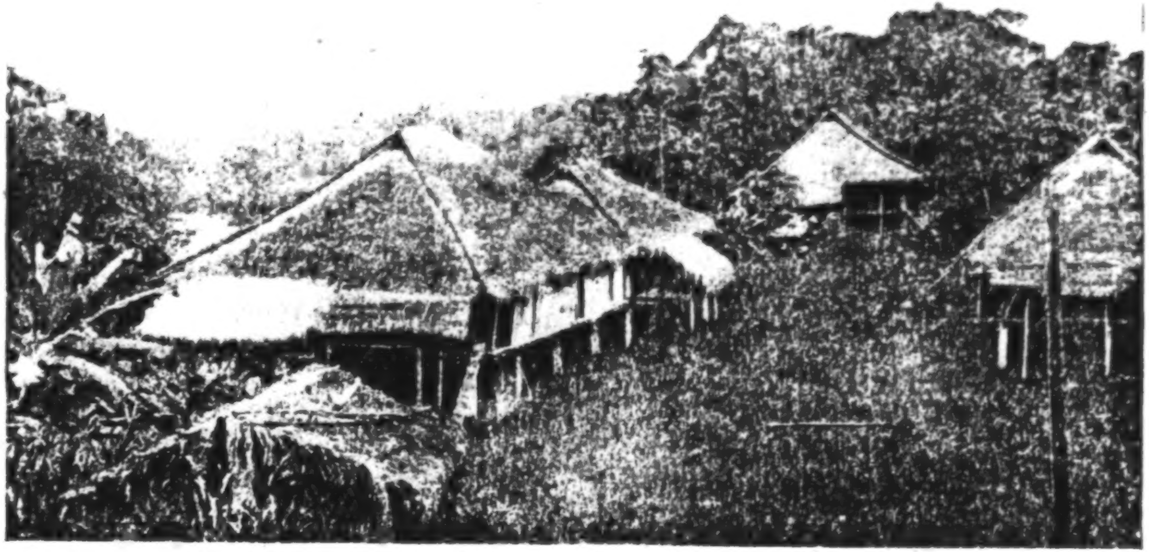
[p.54 (E)]



CHIEF'S HOUSE, SAPAYO GRANDE

growth of the jungle are cut away from time to time 245
around these palms, and about once a year, usually on the occasion of harvesting leaves for a thatch, the crown of leaves is trimmed. Any drooping dead leaves at the base of the crown are thrown away and the thoroughly mature healthy leaves only are selected for the thatch. Thus there remain at the center of this crown a number of young and more tender leaves which serve the needs of the plant itself and prevent damage to it which might otherwise arise from the loss of the mature leaves.

The tagua is a low-growing species of palm, the upper end of the stem, from which the leaves spring, rarely exceeding sixteen feet above the ground. The leaves are therefore easily gathered by means of a short ladder. This, combined with the fact that the tagua produces 324
a very good quality of leaf, makes it almost the only species used for permanent thatch. While several other species of palm produce leaves of durable quality, they grow to such height that it is not expedient in most cases to gather the leaves except by cutting down the palm itself.

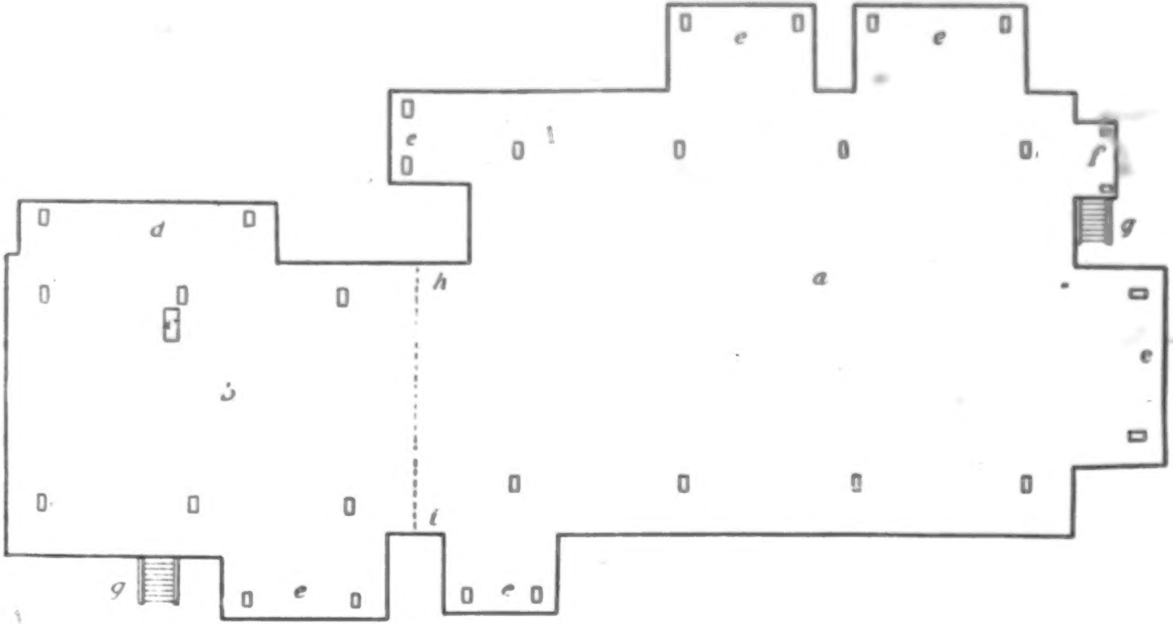
The tagua leaves, which reach an average length of 34
about fourteen feet, have stout leaflets extending from 342
the midrib at an angle of perhaps seventy degrees and for a distance of about three feet on each side of the midrib. To prepare the leaves for use, they are split in two along their midribs. Four of these half-leaves are then laid together so that the natural under-surfaces of the leaflets all face the same direction and the midribs are tied together with pitigua at two points.

342 [349] 314 A platform of bamboo is next constructed at an elevation of two or three feet from the ground. The split green leaves, prepared as above, are then placed on this platform and a thatch built over and around them so as to protect them completely from the weather. This is done usually at the place where the leaves are cut, probably more as a matter of convenience than for any other reason, since the leaves when green are very heavy but on drying become very light. They are allowed to season here for at least two months, after which they are transported to the point where they are to be used. In some cases, however, the freshly cut leaves are transported at once to the house for which they are intended and there cured.

This seasoning in a dry place is absolutely necessary, since if the leaves were placed on the roof while still green, the constant rains of this region would soon rot [825] them. It is further claimed that if used when green they are soon attacked by insects, especially cockroaches, which, as before mentioned, are very numerous and troublesome.

342 177 The negroes also use the tagua-leaf to a large extent for thatch, and in its preparation they are very strict in their observance of certain rules concerning the phases of the moon. No timber may be felled and no thatch leaves cut in the light of the moon. In the case of timber, it is claimed that it is both subject to the attacks of insects and is rendered much more likely to break or split in working if cut in the light of the moon than if cut in the dark of the moon. Likewise thatch

BARRETT - CAYAPA INDIANS PL. XI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GROUND PLAN OF CHIEF'S HOUSE

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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[p. 55(a)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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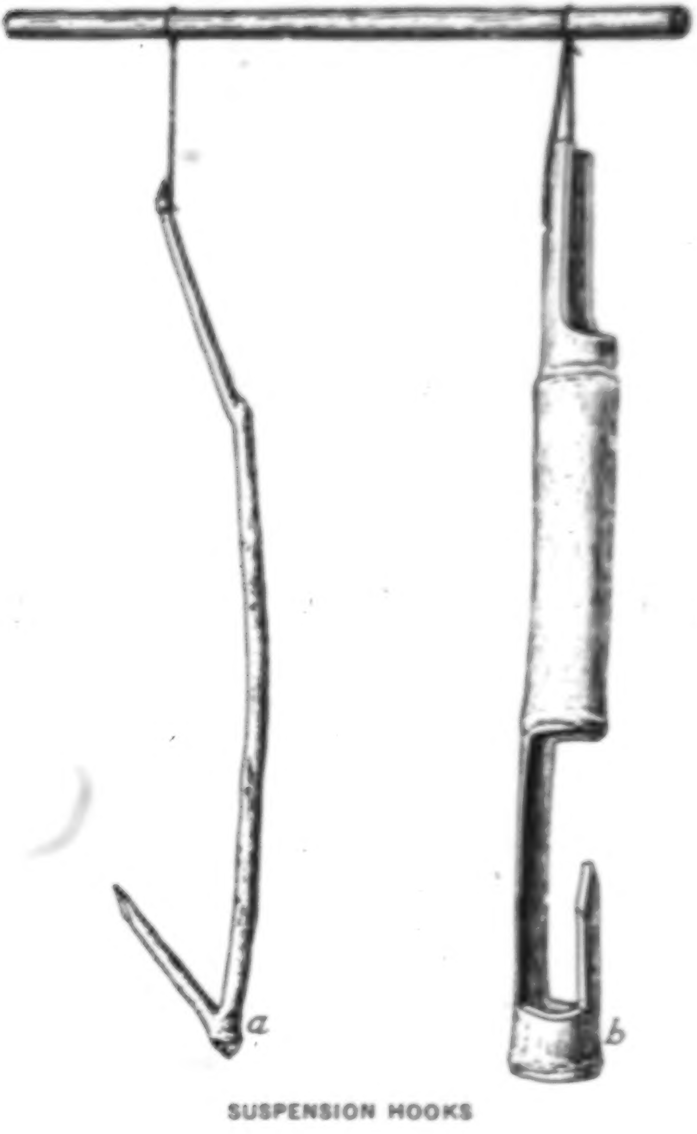

SUSPENSION HOOKS

[p.56(B)]

cut in the light of the moon is practically worthless. 177
The Indians, however, while they have adopted certain 342
of the negro customs, and while they recognize this one to a limited extent, are usually much more governed by necessity and convenience in the cutting of the thatch or the felling of timber than by the phases of the moon.
The bundles, or sets, of four half-leaves are applied 342
directly to the bamboo rafters, the midribs of the leaves being quite sufficient to serve as horizontal supports for the thatch. Beginning at the eaves, the bundles are laid in courses in the same manner as are shingles. The natural underside of the leaf is placed uppermost, and the courses are laid with only about six to eight inches of the tips of the leaflets exposed to the weather. Each bundle is securely bound with pitigua, in from [284]
two to four places, to the rafters it crosses. By this overlapping process a thick and watertight roof is secured. The leaflets run directly down the slant of the roof, thus naturally tending to conduct the water from one tier of thatch to the next. Further, as above mentioned, the natural undersides of the leaflets are placed uppermost, and each of these leaflets forms a small shallow trough which readily conducts water. The thatch of the large house above referred to and illustrated (pl. XI) is no less than three inches, and in places probably four inches, in thickness. In this structure the northern gable of the section *a* consists of ten rafters covered with fifty-seven courses of thatch. The sides of this section consist of seventeen rafters covered with sixty courses of thatch.

342 The last courses of thatch covering the side roofs are so laid as to overlap one another and to securely cover the ridge-pole. Further, another special course or two are laid along the ridge so as to guard against any possibility of leakage. Surmounting the roof along this ridge-pole is in many cases a rider made of bamboo and consisting of two or more sets of short bamboo poles crossed at the ridge and extending from three to several feet down upon the sides of the roof. To the points where these sets cross are bound a horizontal pole which serves to tie them together and to form them into a strong unit. Such riders may be seen in pls. II, VIII, X.

Though such a roof is carefully made, it is likely to leak a little from time to time as some small portion of the thatch which was not properly cured gives way or as some leaflets are eaten by insects. Such a leak is [824] quickly and effectually mended by placing a green leaf of hoja blanca between the courses of thatch at this point. These tough leaves are from three to four feet long and from twelve to eighteen inches wide, and effectually shed the water. In case, however, a considerable section of the roof becomes leaky, the area affected is re-thatched with tagua-leaves.

Buildings of the second class, the rancho or temporary structure, are built on the same general plan as are the permanent dwellings, except that they are much more [824] rudely constructed. In place of the well-squared, durable house-posts, bamboo is generally used. Further, in lieu of a thatch of a more durable kind of palm-

3: Barrett E-5 (1908-1909)1925

SD6 Cayapa SD6

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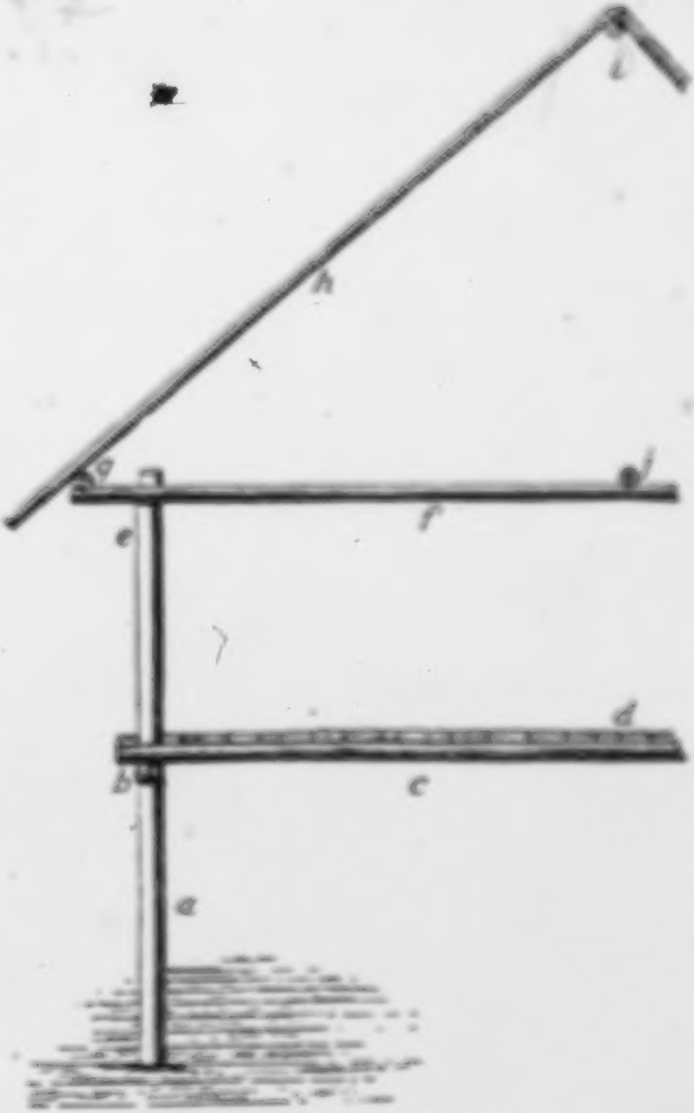
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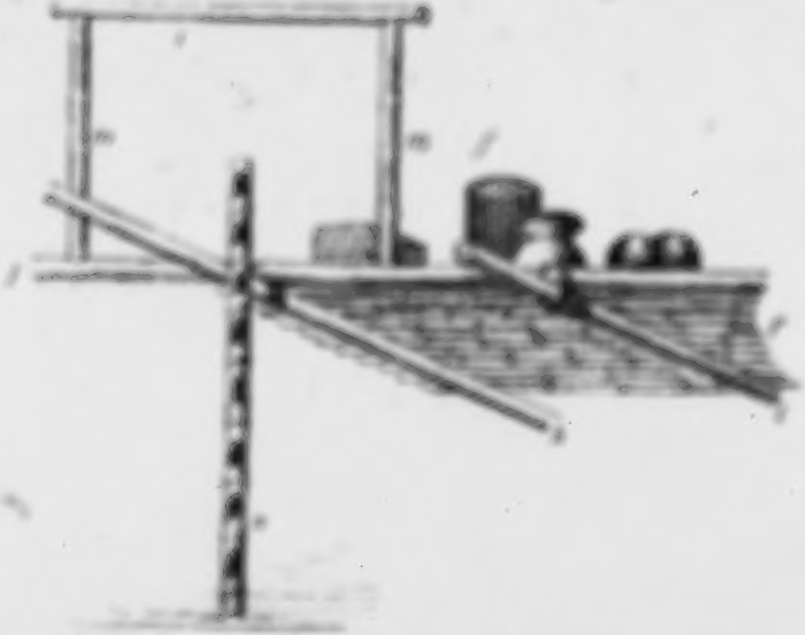
DETAILS OF HOUSE CONSTRUCTION

[p. 38(A)]

[p. 58(a)]



STORAGE PLATFORM OR LOFT

leaf, a covering of the most available material is employed. 342 The material used for this temporary thatch [624] is usually a palm-leaf, but generally of some species of palm which provides a much less durable thatch than that used for the permanent dwelling.

These ranchos serve two purposes almost exclusively, namely, temporary shelters while traveling, and temporary shelters for work which lies too far from home to make daily journeys to and from the regular dwelling profitable. When traveling it is infeasible, not to say dangerous, to sleep upon the ground and without some kind of a roof, owing to the torrential rains which are almost sure to occur during the night, as well as to the danger from poisonous reptiles and other creatures. If, therefore, in traveling, it is impossible to reach a house by night, an early halt is made and a rancho constructed. This is rarely necessary except in case of a long trip over an uninhabited mountain trail, since along the navigable rivers are houses which may be reached in the course of the day's travel. Here the traveler, whoever [57[illegible]] he may be, is always welcomed according to the custom of the country, the unwritten law of which requires [209] that shelter be given any traveler, whether he be an old acquaintance or a total stranger. When it is necessary, [222] in gathering rubber or pita, in making canoes, or in doing any other work, to journey so far from the permanent dwelling as to make daily travel back and forth unprofitable, a small rancho is built. Such a structure may be used for a short time or for several seasons, it being re-thatched as occasion demands. In the

342 village of Punta Venado is such a rancho, built with
its floor of bamboo resting almost upon the ground.
On the other hand, ranchos that are built for regular
temporary shelters such as those above mentioned,
have their floors raised from two to four feet from the
ground. This rancho in the plaza of the village is shown
in pls. CXXXII-CXXXIV. In the background of pl. CXXXII
and pl. CXXXIII distant views are illustrated, and pl.
CXXXIV shows it in detail and indicates its special and
interesting use. During one day only of the year is
796 this rancho occupied. At the fiesta held during Easter
[351] week the entire plaza is carefully cleared of its dense
778 growth of weeds, grass, and vines, thus making access
to the rancho possible. Before dawn on Easter Sunday
itself, all dancing in the village ceases. The musical
instruments are transferred to this rancho and a procession
is formed which brings some of the images of saints
from the church to the rancho, where they sit in state,
as it were, throughout the day, while music is played
before them almost constantly. It is said that this
is the one day of the year when these saintly images can
[272] drink as human beings, and they are frequently offered
guarapo, a calabash of this cane juice being placed to
[784] their lips as if they were in the act of drinking. During
this time people are prohibited from drinking rum in
the presence of the images, though they may drink as
much guarapo as they desire.

348 The cane-mill, which is itself an important and a permanent
building, is constructed in exactly the same
manner as a regular dwelling. It is usually situated

near the permanent dwelling, and is almost always 348 surrounded by cane-fields. The cane-mill is equipped [274] with what may be termed the mill proper, consisting of a pair of large and very heavy rollers with a large hand-wheel used in turning them, the large storage pots for fermenting the cane juice, and the fireplace and pottery still used in distilling the rum made from the fermented juice. The similarity which such a mill bears to an ordinary dwelling is shown in pls. I, II, in each of which the structure to the right is the mill, and that to the left the dwelling. These two illustrations show also how close together the mill and the dwelling are sometimes built. In pl. VI is shown an isolated mill, with a field of young cane in the background. The dwelling of the owner of this cane-mill, illustrated in pl. V, is situated directly opposite on the bank of the river.

The three classes of buildings described are generally 361 isolated from others. The continuously inhabited dwellings are never assembled into villages, but are scattered at intervals along the banks of the stream. There are, however, within the Cayapa territory, three villages, each consisting of a church and a number of houses. These villages are used by the people only [796] when they come together for religious feasts and on other festival occasions. The houses in these villages are never occupied regularly except at such times, though they are constructed in every way like the dwellings occupied permanently by the people as homes.

The church, which of course is a modern institution, 346 having existed only since the time of the Spanish con- 177

346 [177] quest, differs from the other buildings in that it is not raised above the ground and in that it is always enclosed nowadays with lumber obtained from the mills near the mouth of the river. Within the church there is a rude, high altar, with several images of saints; otherwise the building is entirely unfurnished. The front of the church at Pueblo Sapayo Grande is shown in pl. IV, and the fundamental differences in construction between a church and a dwelling are well shown by the contrast between the two buildings in this illustration. [342] The building in the left foreground is the convento, or house of the priest, and is a typical Cayapa dwelling in every respect. The most characteristic features of a church—its lack of piles, its completely enclosed sides, and its roof, the central portion of which is raised some feet above the remainder—are well shown in the illustrations of the church at Punta Venado. This structure, which is the largest of the three churches of the Cayapa, is shown in the background of pl. XXIV and in pls. CXXXII, CXXXIII, CXXXV, and CXXXVII. It is about 80 feet long, 35 feet wide, and about 25 feet high at the ridge of the building. The eaves are about 10 feet above the ground. This building is nearly twice the size of the church at either Pueblo Sapayo Grande or Pueblo San Miguel. Of these two churches the latter is somewhat larger than the former. The church at Punta Venado differs from the other two also in that it has a wooden floor, which, like its sides, is made of sawed lumber. The framework of the church is in all essentials the same as that of a dwelling, except for the fact that the

3: Barrett E-5 (1908-1909)1925

SD6 Cayapa SD6

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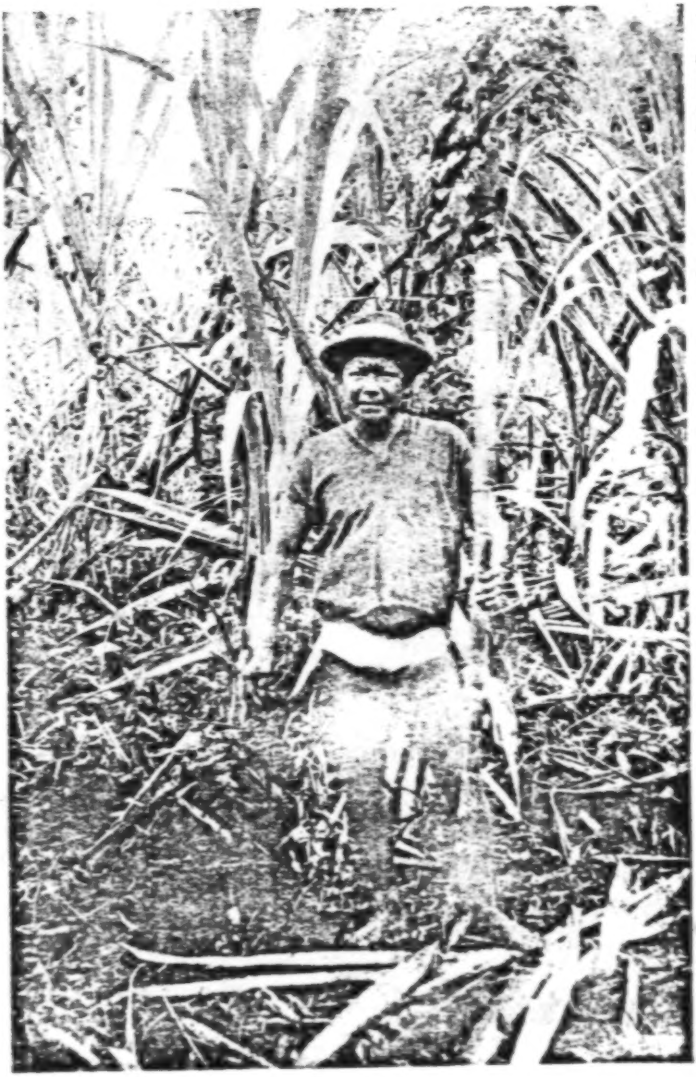

HARVESTING CANE

[p. 62(A)]

3: Barrett E-5 (1908-1909)1925
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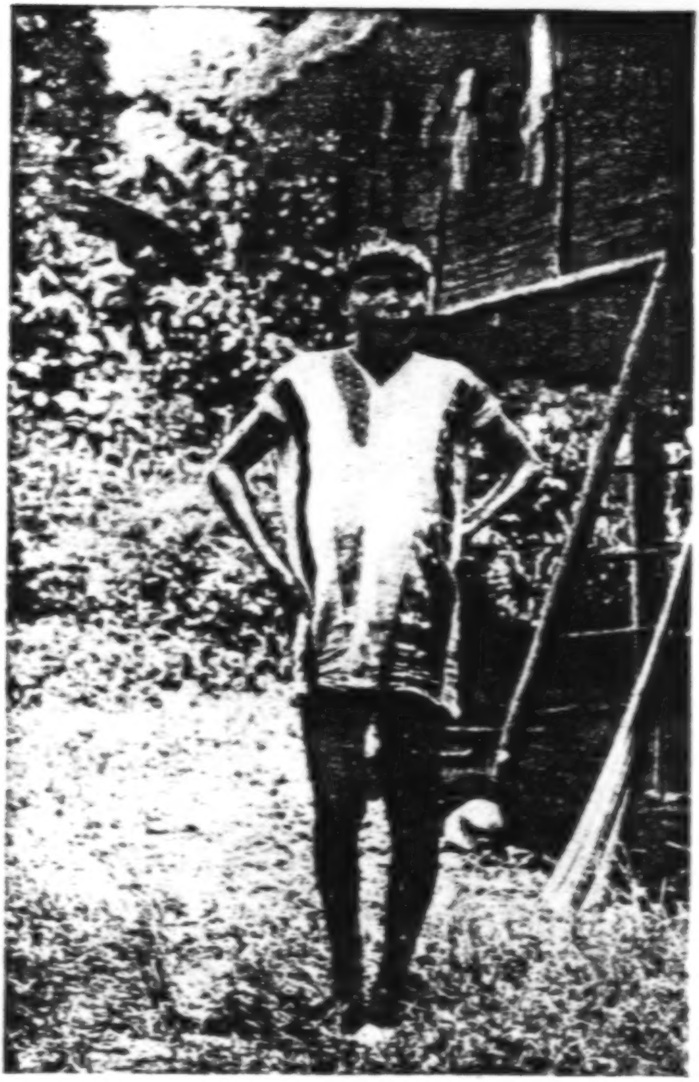

YOUTH IN ORDINARY COSTUME

[p. 62(B)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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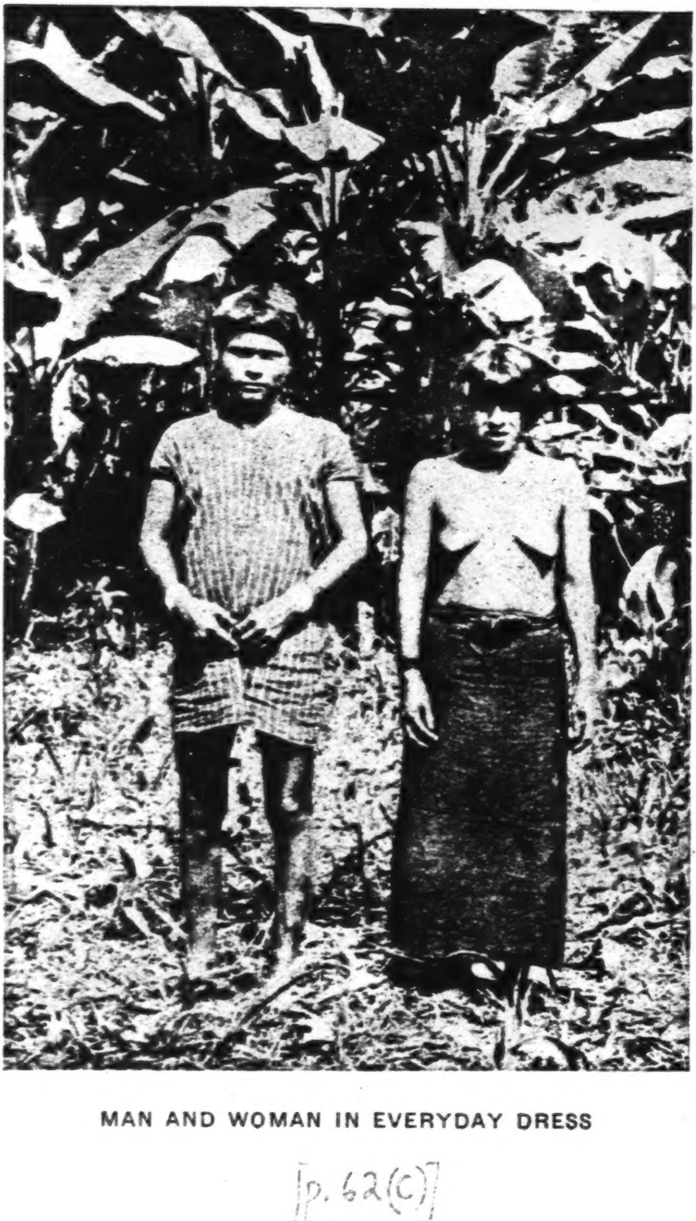

MAN AND WOMAN IN EVERYDAY DRESS

[p. 62(C)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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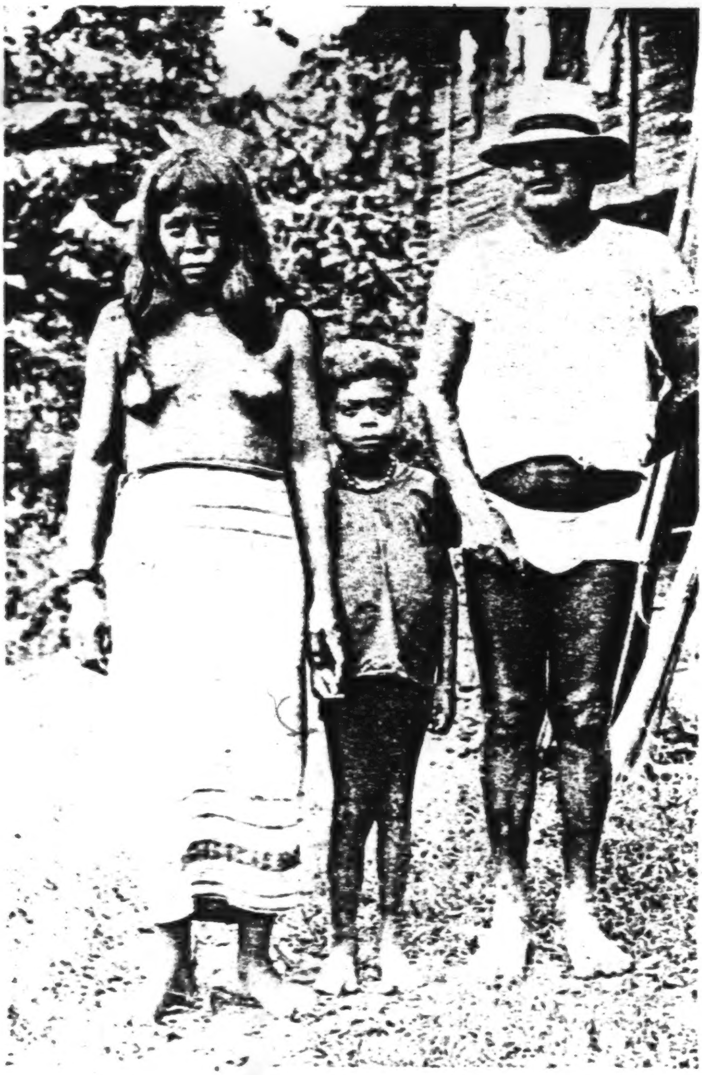


A TYPICAL FAMILY GROUP

[p. 62(D)]

greater size of the structure calls for correspondingly 346
larger and stronger timbers and pillars. Furthermore, the fact that the floor is at ground level makes unnecessary the timbers which in the dwelling are required to support the floor.

### DRESS

At the present time the everyday dress of the men 291
consists chiefly of two pieces: a very small, tight-fitting clout (pl. CXVI, 1–3), similar in appearance to short bathing trunks, and an improvised shirt made of calico or of gaudily figured bandana handkerchiefs.
On special occasions, such as at feasts and other gather- 292
ings, a man adds to this a hat of European or of American [177]
manufacture; necklaces of beads, buttons, and silver 301
coins; wrist-bands and neck-bands of small white 302
buttons; and decorations upon the face and exposed parts of the body in red, yellow, or black paint. These ornaments are used to some extent also in the everyday life of the people. In pls. LIII-LVI are shown various types of necklaces and neck- and wrist-bands, and in pls. XXXIX-LII are illustrated typical paintings of the face, arms, and legs. Some of the men paint very little, others very elaborately; some wear no necklaces or similar decorations, others wear many such ornaments; and still others bedeck themselves in both manners very profusely.

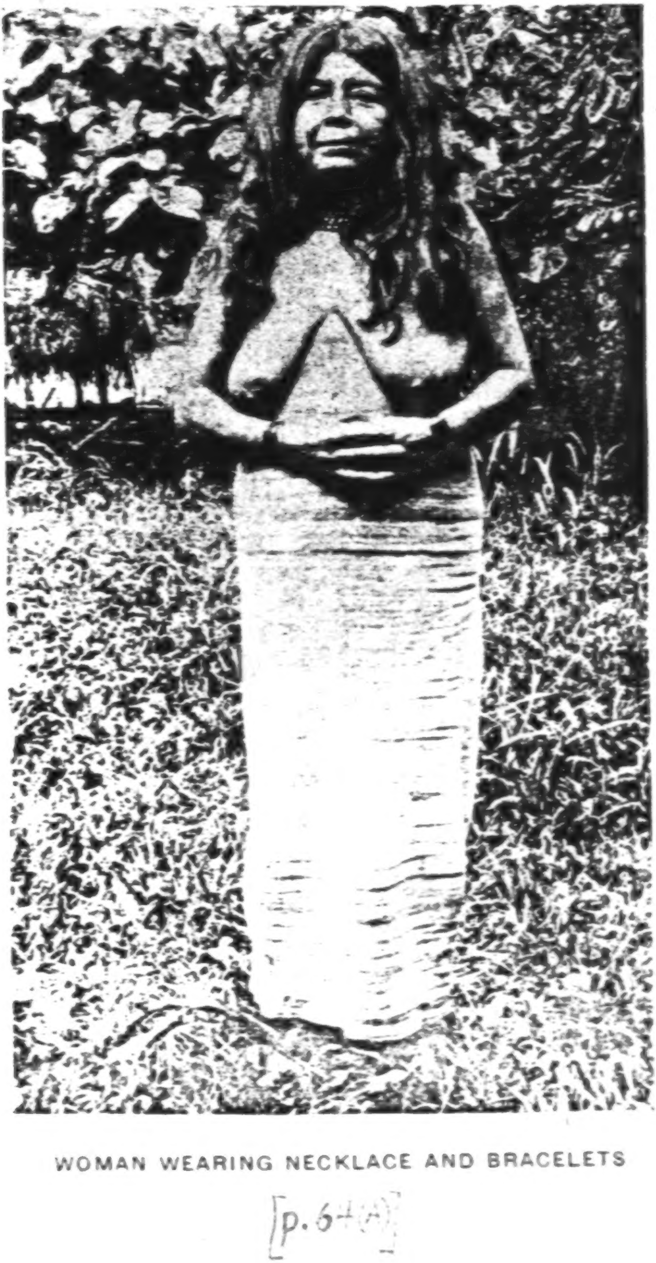
The small trunk is ordinarily made of the same kind 291
of native cloth as is used by the women in their dress. 294
It is cut from a piece woven specially for the purpose

291 and containing a sufficient amount of cloth to make two
294 clouts. Each clout consists of two pieces sewed along
a seam running up the front and back. The cloth
[462] itself is woven by the women, as is the woman's dress
or manta: but the sewing of the clout is done by the
men, for the women almost never do any sewing for
themselves or for others. The fact that the woman's
dress requires no sewing may account for her lack of
291 knowledge in this direction. The clouts are made to fit
very tightly, so tightly in fact that they make deep impressions
in the muscles of the legs. On account of this
tightness no gathering-string or other method of fastening
is ordinarily required. Occasionally a man is found
who makes his clout a trifle looser than customarily,
and provides it, on the right-hand side, with a button
[177] to hold it in place. This is said by the Indians to have
been formerly the universal custom. In recent times,
however, the very tight clout has almost entirely supplanted
the other form.

291 The influence on the life of the Cayapa exerted at the
177 present time by modern commerce and its manufactured
articles is here again shown by the use of white muslin
in the making of the clouts. In fact, at present the
muslin clout is almost, if not quite, as common as is
that made of the native cloth.

291 It is said that formerly, when the Cayapa were mountaineers,
they used the poncho which at present is so
common among the Indians of the interior Andean
region. On migrating into the warmer and more humid
coastal region, however, the poncho was found un-

3: Barrett E-5 (1908-1909) 1925
SD6 Cayapa SD6



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WOMAN WEARING NECKLACE AND BRACELETS

[p. 64(A)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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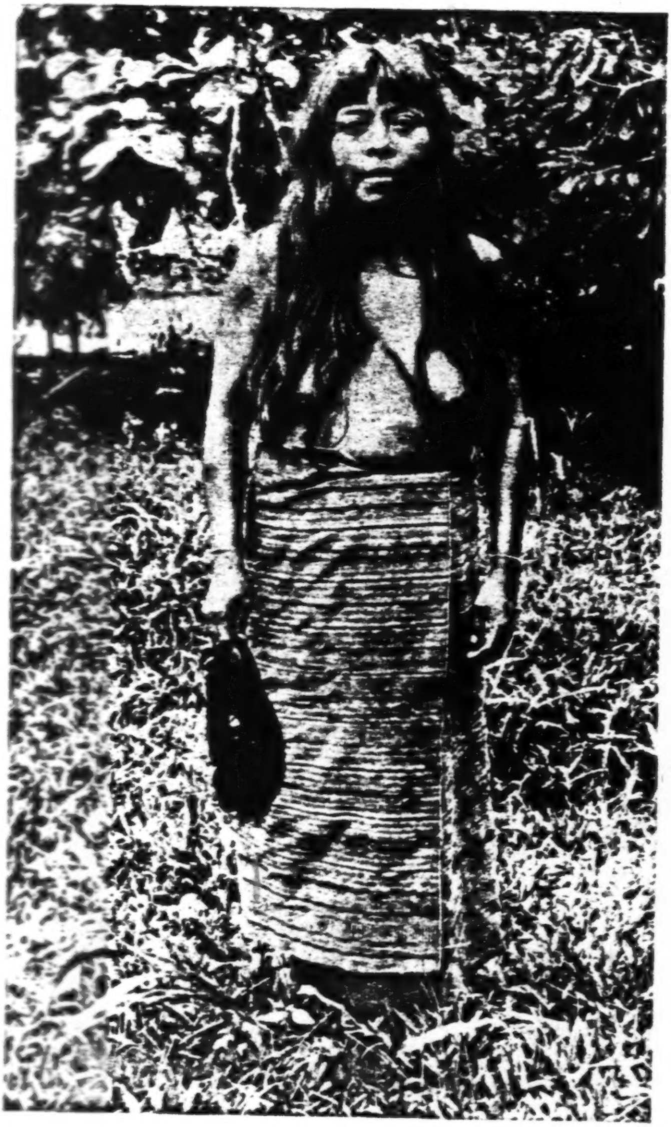
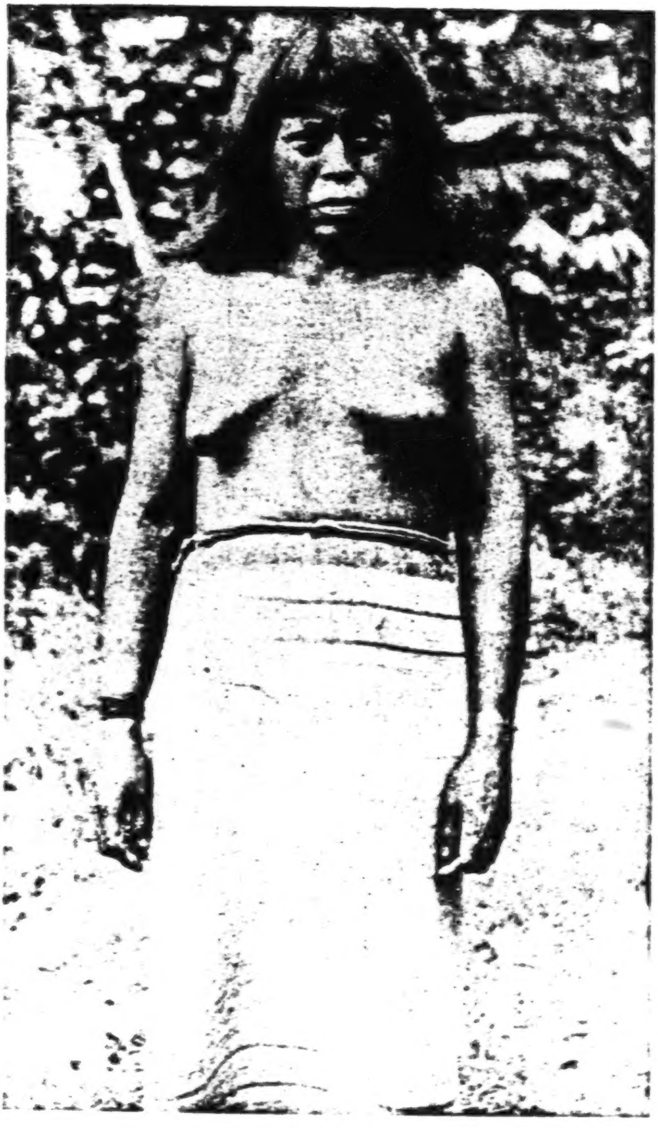


WOMAN WEARING DOUBLE MANTA

[p. 64(B)]

3: Barrett E-5 (1908-1909)1925

SD6 Cayapa SD6



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WOMAN'S CUSTOMARY COIFFURE

[p. 64(c)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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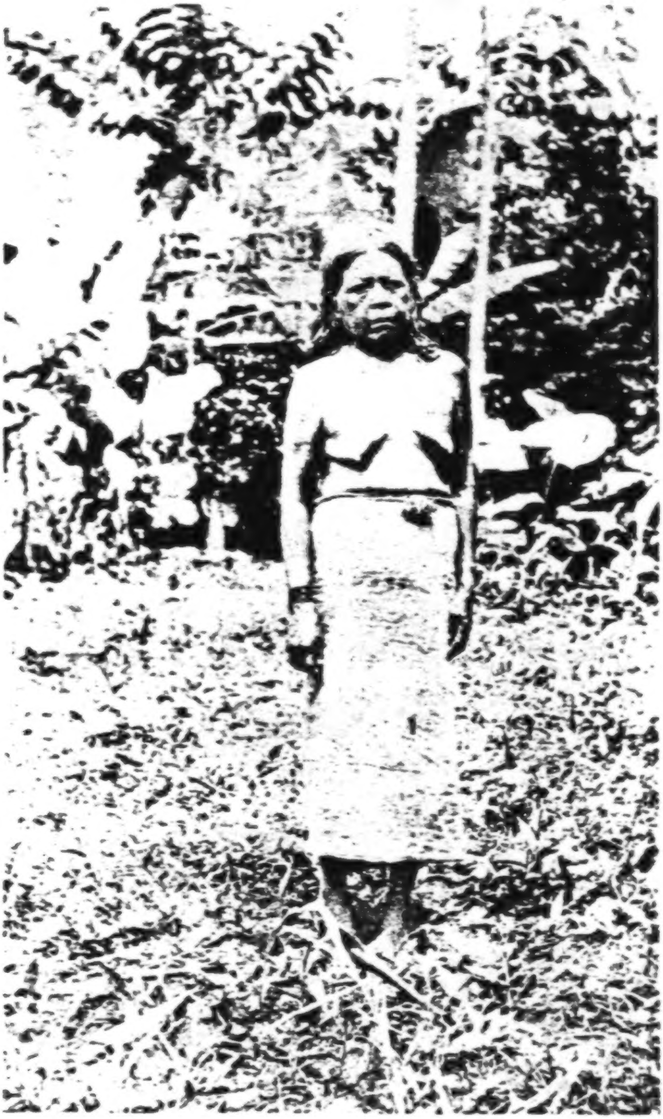
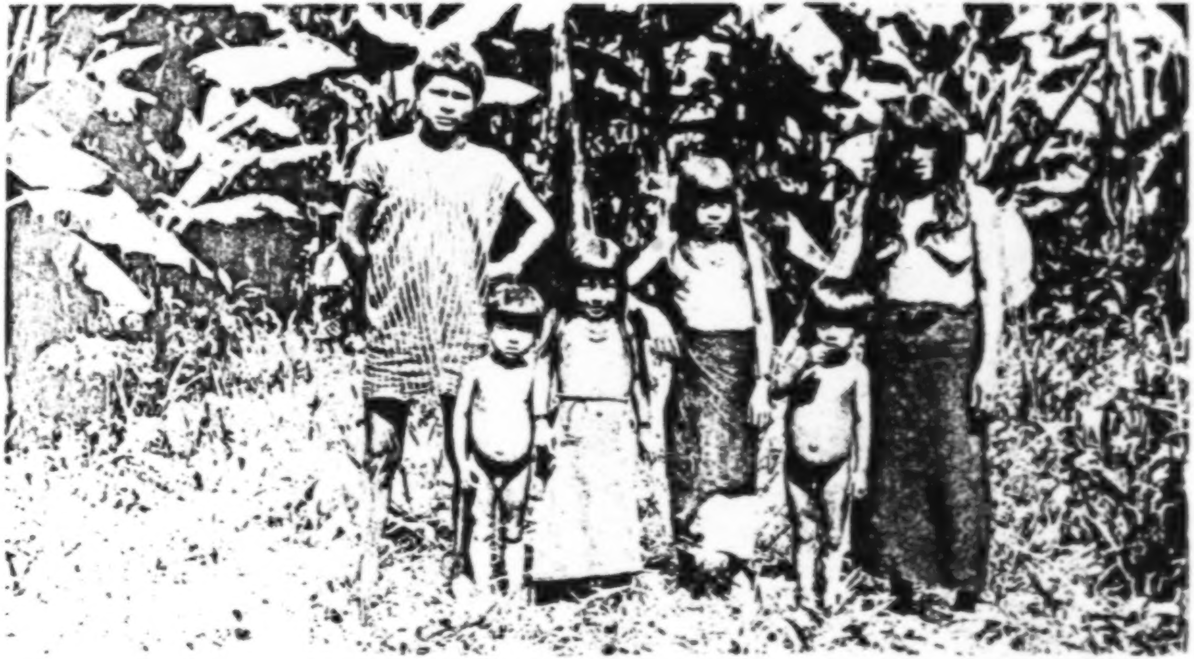


SINGLE MANTA AND TASSELED GIRDLE

[p. 64(D)]



A FAMILY GROUP

[(3)(d) p.41

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3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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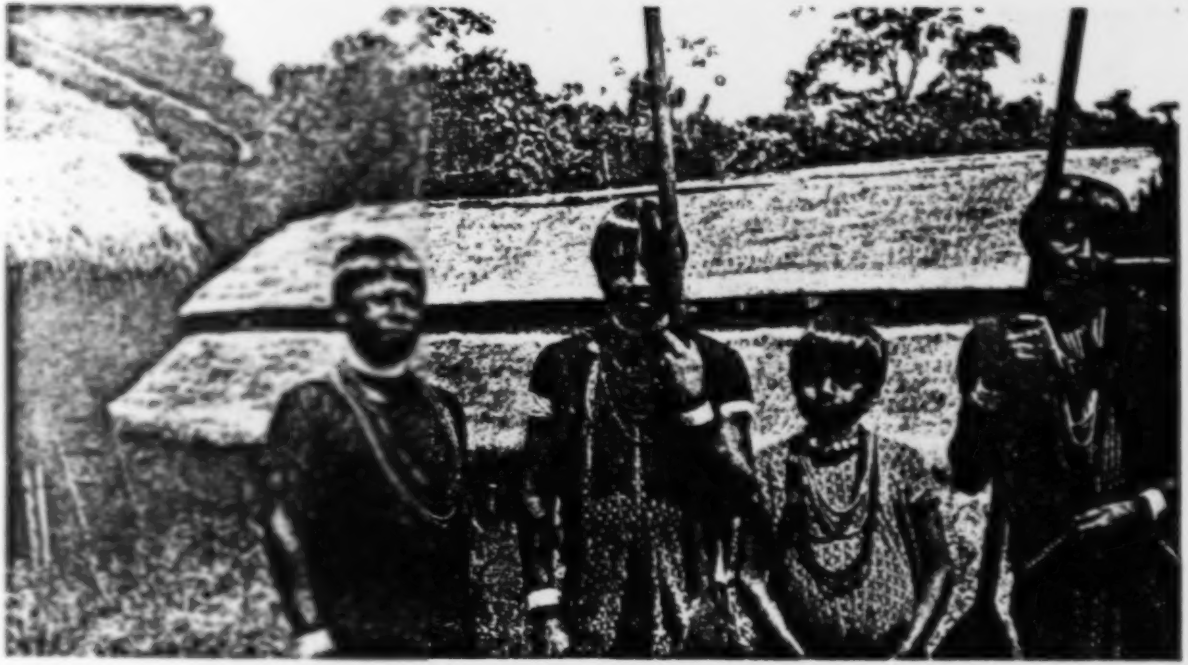
[p.64(f)]



FIESTEROS AND CHURCH AT PUNTA VENADO

# 3: Barrett E-5 (1908-1909)1925
## SD6 Cayapa SD6

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YOUNG MEN DRESSED FOR FIESTA

[p. 6+ (G)]

## 3: Barrett E-S (1908-1909)1925

## SD6 Cayapa SD6

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A TYPICAL HAIR-CUT

[p. 64(a)]

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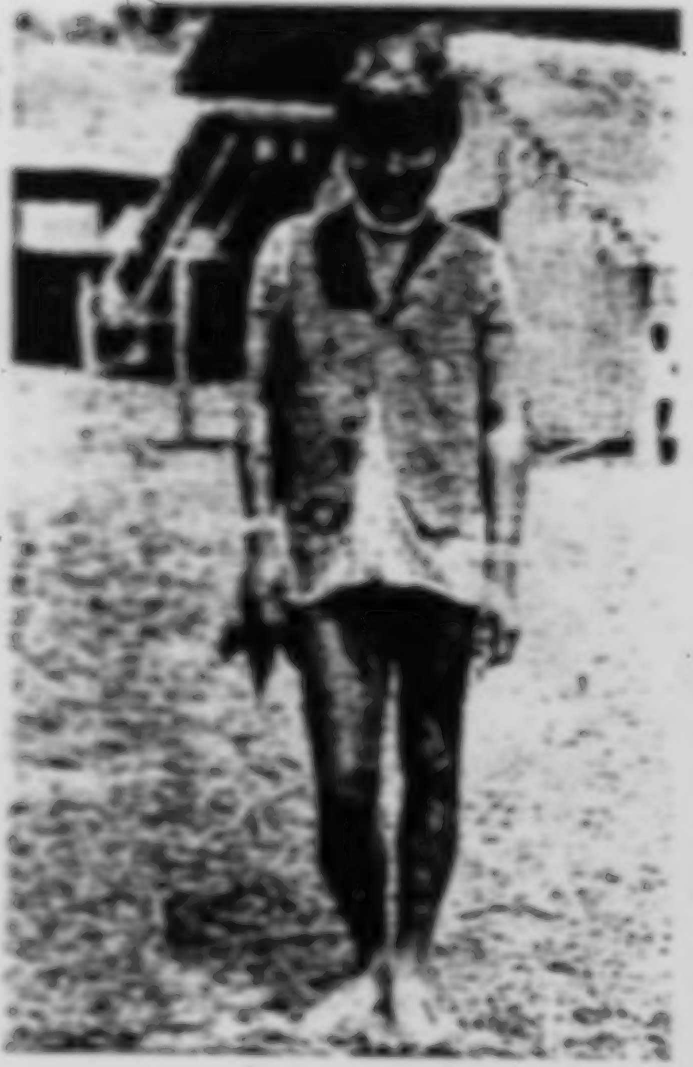
[p. 64(2)]

3: Barrett E-5 (1906-1909)1925
SD6 Cayapa SD6



FIESTA COSTUME COMPLETED WITH A VEST

[p. 64 (J)]

comfortable and gave place to the lighter shirt which 291
at present is made of bandana handkerchiefs or of
calico. Such garments are worn by the men and boys
shown in pl. XXV-XXXVIII. This shirt is made by sewing [294]
the cloth into the form of a bag, with an opening just
large enough to admit the head, and with two openings
at the corners for the arms. At the arm-holes the
garment fits very tightly; otherwise it is a very light,
loose-fitting shirt which protects to a certain extent the
upper part of the body from the strong though diffused
sunlight, and, to a much greater extent, from the
attacks of insects. Often, when about the house or
elsewhere under conditions which make it superfluous,
the shirt is not worn.

Both men and women wear necklaces to a consider- 301
able extent as a part of their daily attire, and on
festal occasions. These ornaments are at present [177]
made largely of glass and porcelain beads of various
kinds, of small buttons, and of silver coins. In primitive
times necklaces probably were as much used as at
present, but they were made largely of the seeds of
certain plants of the region and from the iridescent
wing-covers of a large beetle, *Euchroma goliath*. Neck-
laces of some of these materials are sometimes still
found, but they have been largely supplanted by those
made of the intrusive materials described.

In pls. LIII-LVI are shown various neck and wrist ornaments. Those shown in pls. LIII, 2-6, and LIV are made of seeds of various kinds, selected for their sweet scent or for their color. The one presented in pl. LIII, 1,

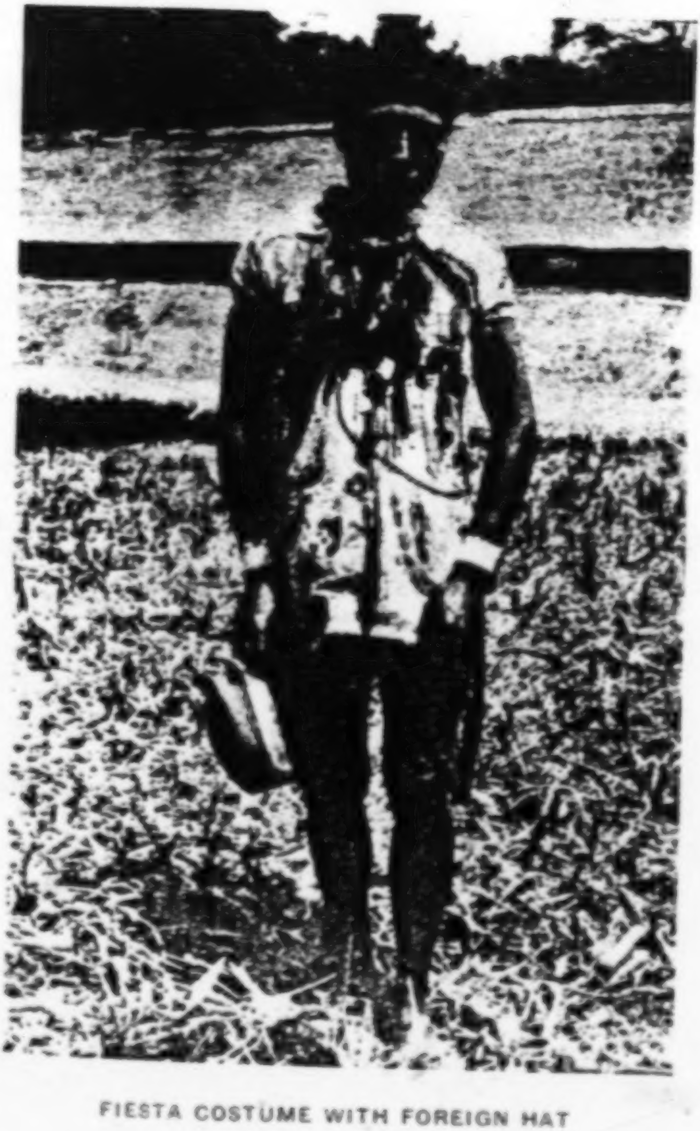
3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

301 is of beads and coins; in pl. LV, 1, is shown a necklace consisting of four strands of glass beads, while in pl. LVI, 2, is represented a necklace of beads, coins, and sweet-scented leaves, with two pan-pipes attached to it. A unique type of neck-band is shown in pl. LV, 2, 3; these consist of a woven band to which are attached pendants of haliotis shell. In pls. LV, 4, and LVI, 1, are illustrated a neck-band and a pair of wrist-bands made of buttons, to the former of which are attached a number of coins.

301 304 Perforation of either the nose or the ears appears to have been an unknown custom among Cayapa men, hence no nose or ear ornaments worn by men are found. Some of the women at present perforate their ears and suspend from them, as ornaments, small strings of beads or other bright manufactured objects. Neither 291 men nor women ever use native shoes or sandals of any 177 description, nor in former times were hats worn by the men. Subsequent to the Spanish conquest, however, a hat, resembling in form that of the conquistadores, was made from pitigua and used to a limited extent by the men. At present the men use, especially at times of fiestas, the white-man's hat and other wearing apparel obtained from the settlements down the river. Vests and derby hats are highly prized, the former being decorated with buttons, bright-colored yarn, and especially with rows of small silver coins. Those who do not possess vests of the kind made by the whites often improvise a vest-like garment from ordinary cloth. Such a garment is in use by the larger individual seen

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

BARRETT—CAYAPA INDIANS PL. XXIX



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FIESTA COSTUME WITH FOREIGN HAT

[p. 66(A)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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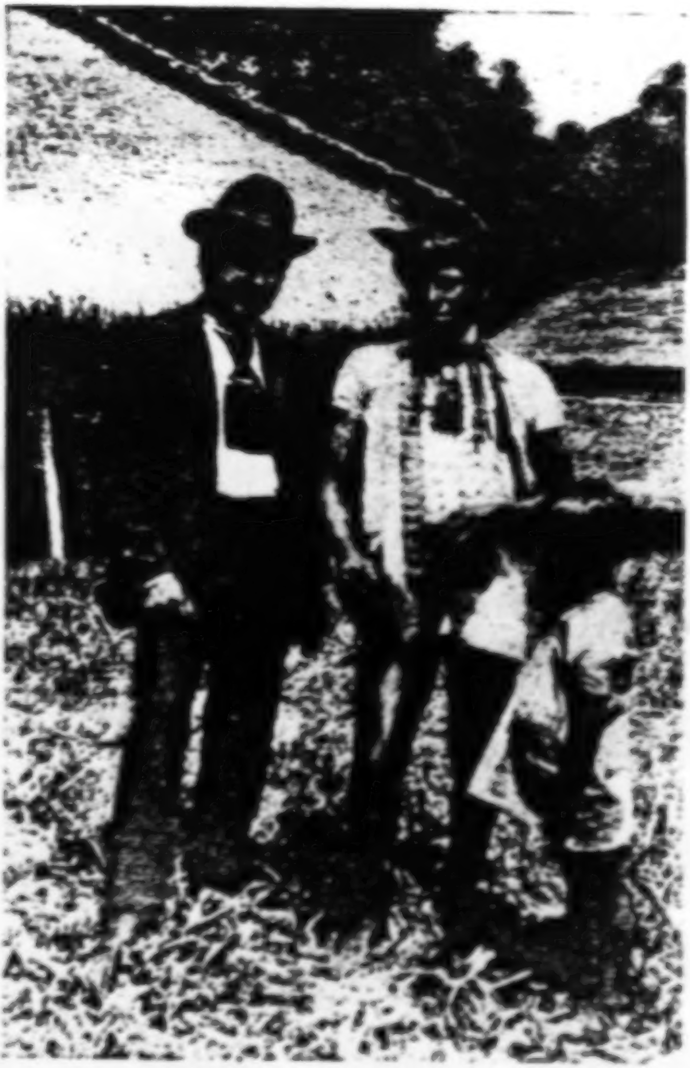
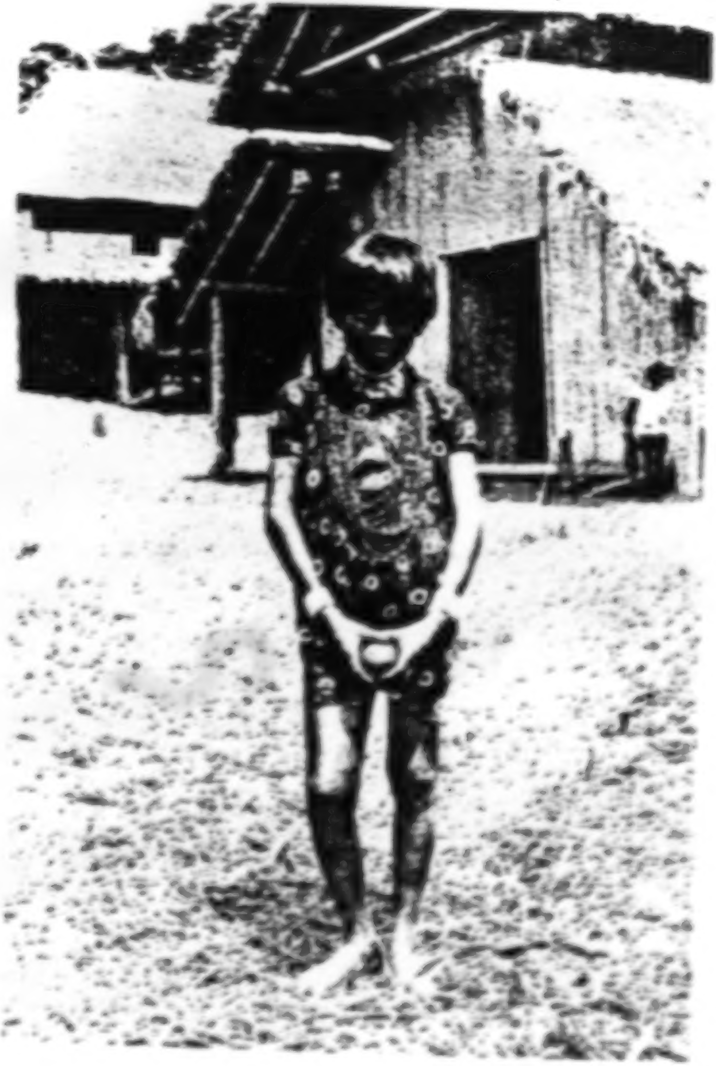


FIESTA COSTUMES

[p.66(B)]

BARRETT—CAYAPA INDIANS PL. XXXI



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BOY DRESSED FOR FIESTA

[p. 66(c)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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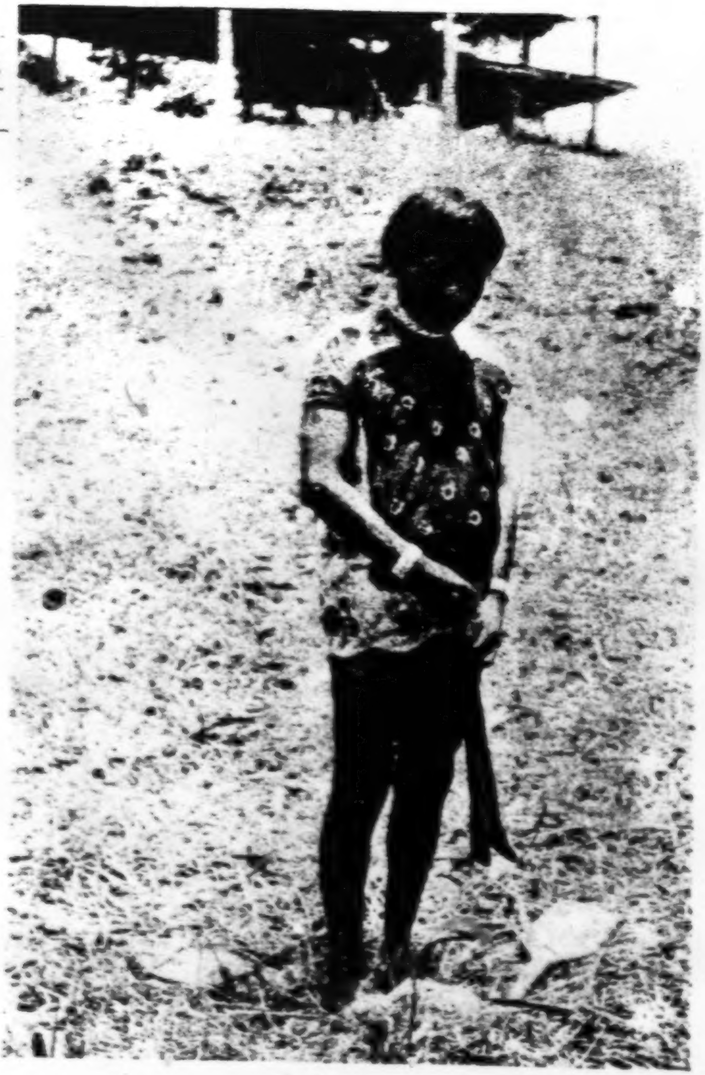
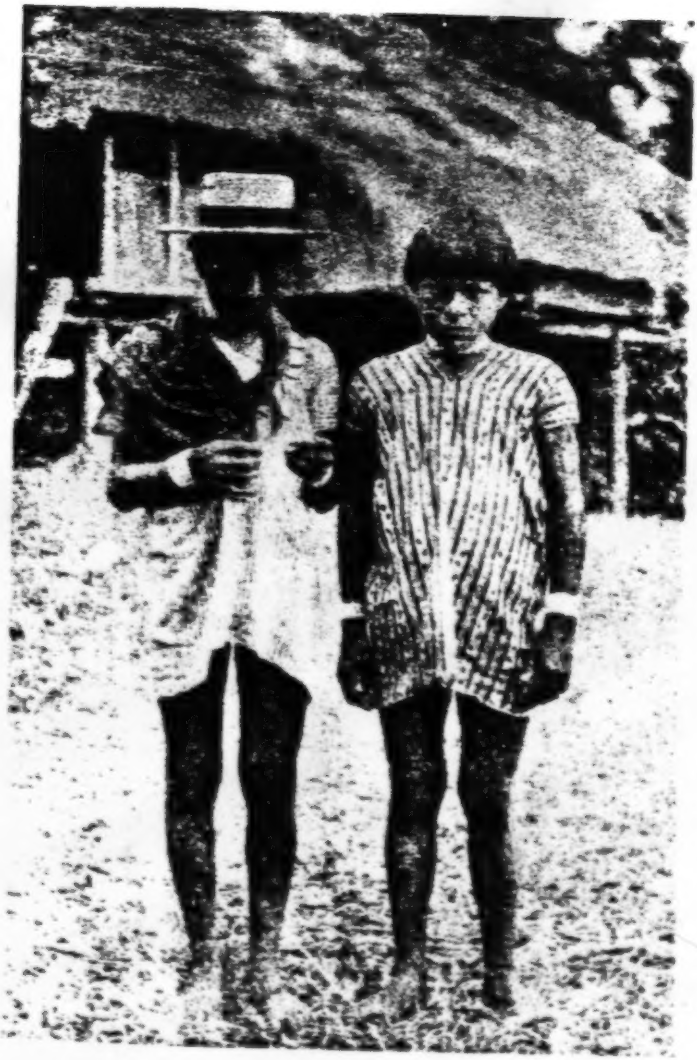


BOY DRESSED FOR FIESTA

[p. 66 (D)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6



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FIESTA COSTUMES

[p. 66(E)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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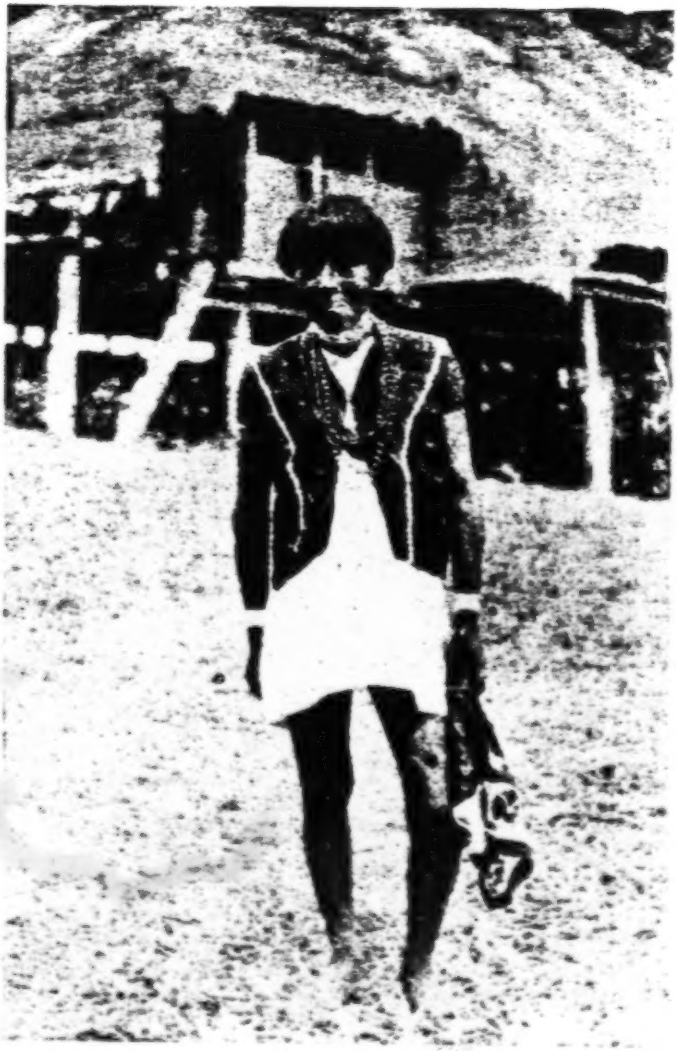


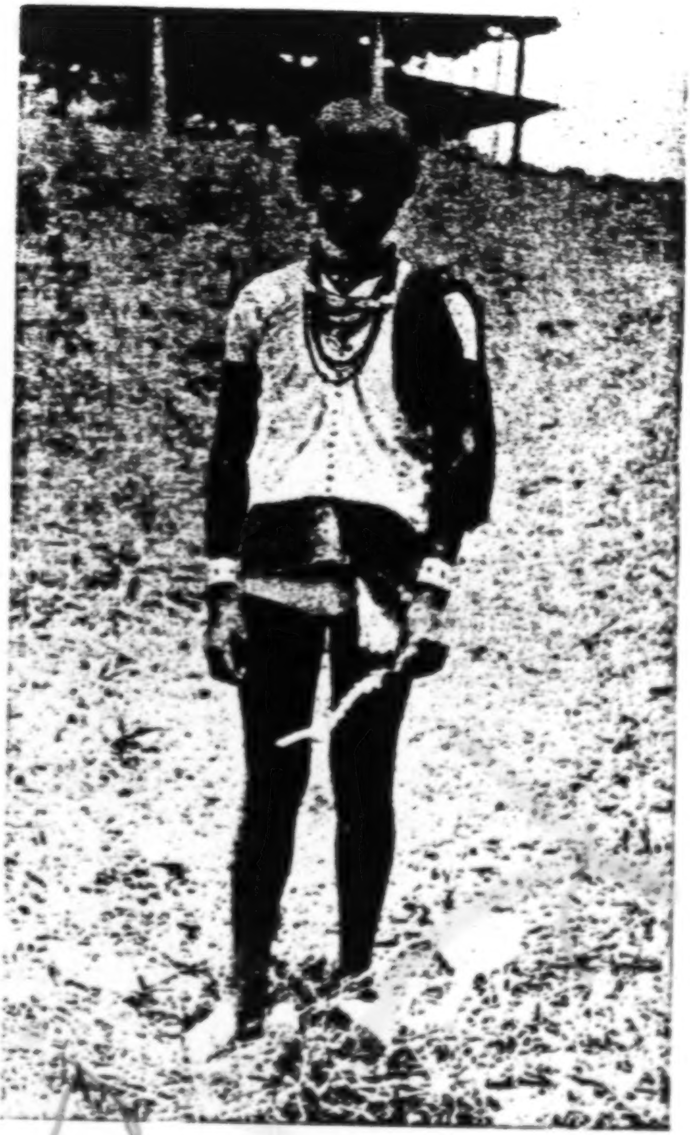
FIESTA COSTUME

[p. 66 (F)]

3: Barrett E-5 (1908-1909)1925

SD6 Cayapa SD6

BARRETT—CAYAPA INDIANS PL. XXXV



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FIESTA COSTUME

[p.66 ([illegible])]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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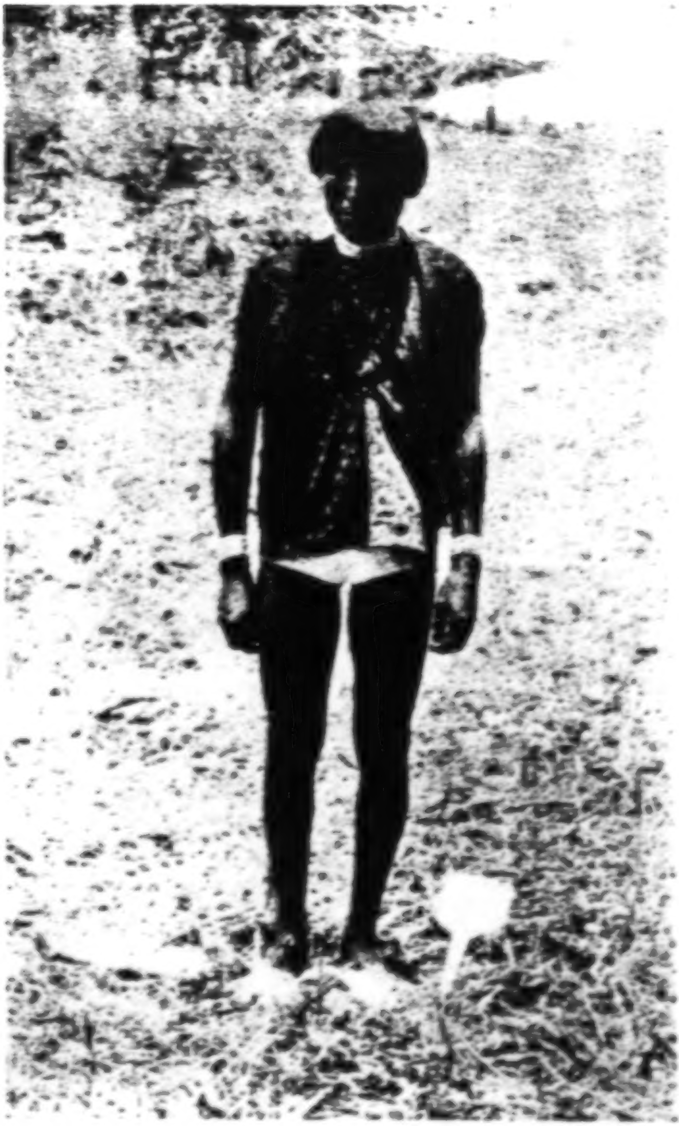
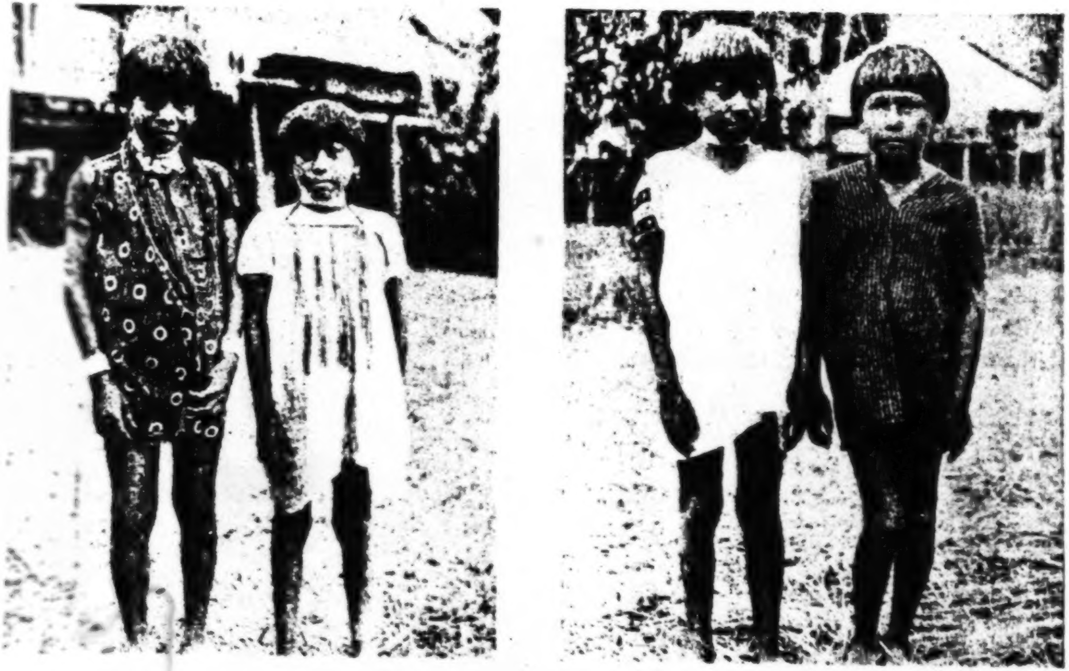


FIESTA COSTUME

[p. 66 (H)]

[p.66(I)]



BOYS DRESSED FOR FIESTA

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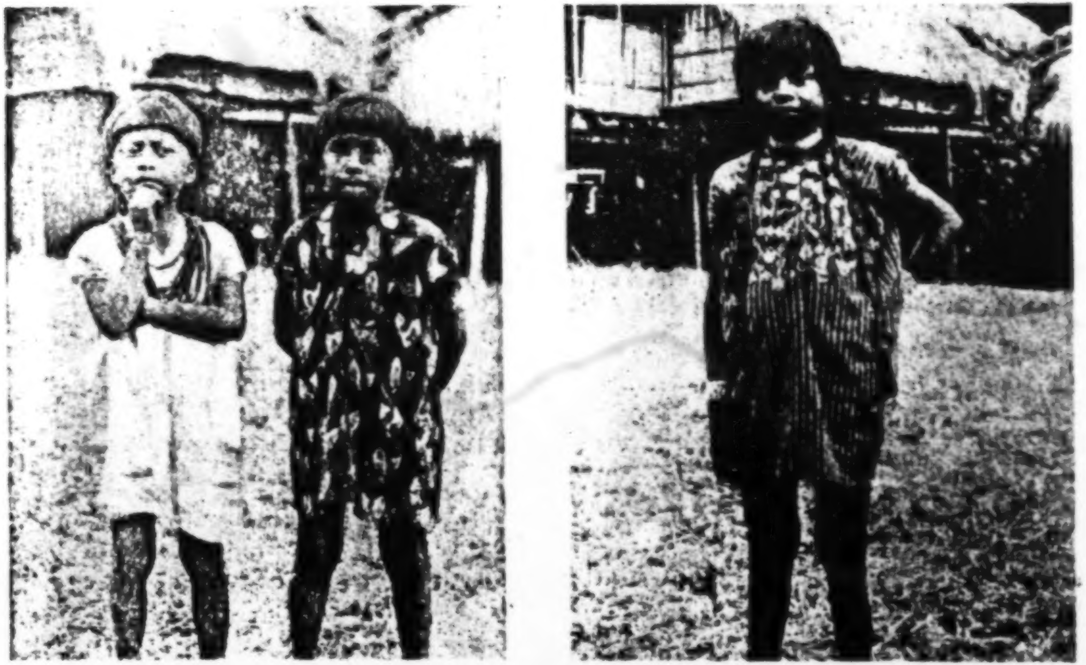


BOYS DRESSED FOR FIESTA

[p. 66(J)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

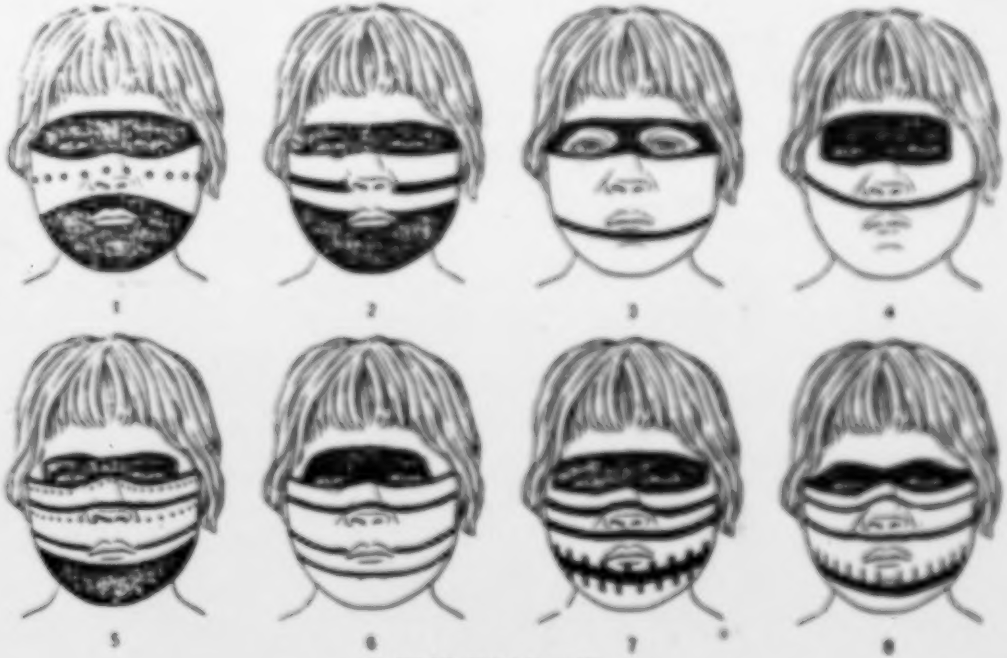
in pl. XXV. These improvised vests are often decorated with small holes in lines or in crosses or other patterns. 291 177

The everyday dress of the women consists of a manta, or skirt (pls. CXII-CXV), girded about the waist usually with a narrow tasseled belt (pl. CVII, 1, 2). In addition, necklaces are almost always worn, and ear pendants are sometimes used. This simple attire is also the one worn at feasts and other gatherings, except on certain special occasions, such as dances and church ceremonies. At such times the head and upper part of the body are completely covered with bright-colored calico or with gaudy bandana handkerchiefs; also in canoeing on a hot day a similar covering for head and shoulders is made of black or bright-colored calico, or of handkerchiefs. With this head-covering for canoeing is usually worn a ma'te, or hemispherical calabash cap, as a further protection from the sun. The manta, or skirt, above mentioned, is almost always of native fabric, and consists simply of a rectangular piece of cloth sufficiently wide to reach from the waist to slightly above the ankles, and of such length as to pass once and a third round the body. The two vertical edges of the garment are made to overlap at the back, and by pulling from time to time upon the upper corners, the garment is held in place under the narrow woven belt or the pita cord which is sometimes used in its stead. Frequently also over this tightly woven and fairly heavy garment is worn another of lighter material, which passes in the opposite direction about the body, so that the edges overlap in 291 301 302 291

291 front. In such cases, sometimes the belt is placed outside the two garments, but more frequently it binds the under-garment only, the ends of the light outer garment being merely tucked under the belt at the front. This outer skirt is very frequently of calico or other light cloth, and is in no way essential to the dress. It may, however, be a second manta, and as large and heavy as the main under-garment. In pls. XIX, XXI, XXII, are shown women wearing the single manta; in pl. XX is presented an instance in which a second outer manta is worn with its corners tucked under the belt at the front, and in pl. XXIII the larger of the two girls wears in a similar manner an outer garment made of calico.

Ordinarily, children up to the age of six, and sometimes even up to ten years, wear no clothing at all. Usually, however, a girl begins to wear her manta, and the boy a short calico shirt, at the age of six or eight years; but the boy does not put on a clout until later, often not until about the age of twelve. On the other hand, frequently very small children, even those two or three years of age, are provided with clothing which they wear in imitation of their elders on gala occasions.

854 Practically the only time that babies are clothed at all is while sleeping; they are then tightly wrapped and bound in cloth, but without a cradle-board or a basket. They are placed crosswise in a hammock provided with a mat or a piece of bark cloth to hold it open and thus to form a kind of cradle. At one side of the hammock
354 is attached a long braided string, made from the young
283 leaf of a certain species of fan-leaf or from an ordinary



FACE PAINTINGS

[P.68(A)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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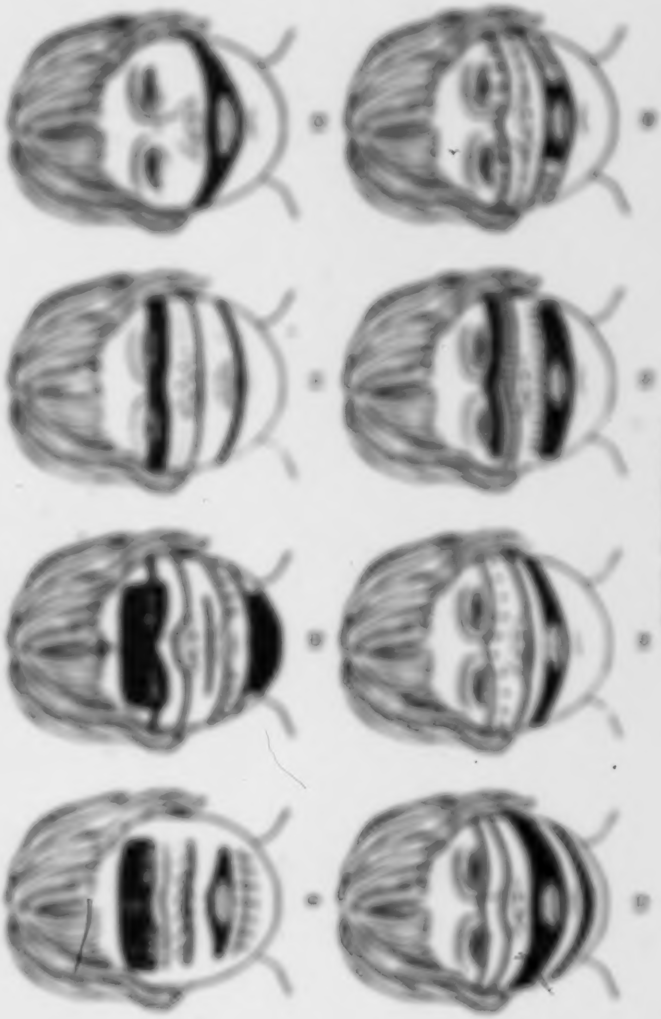
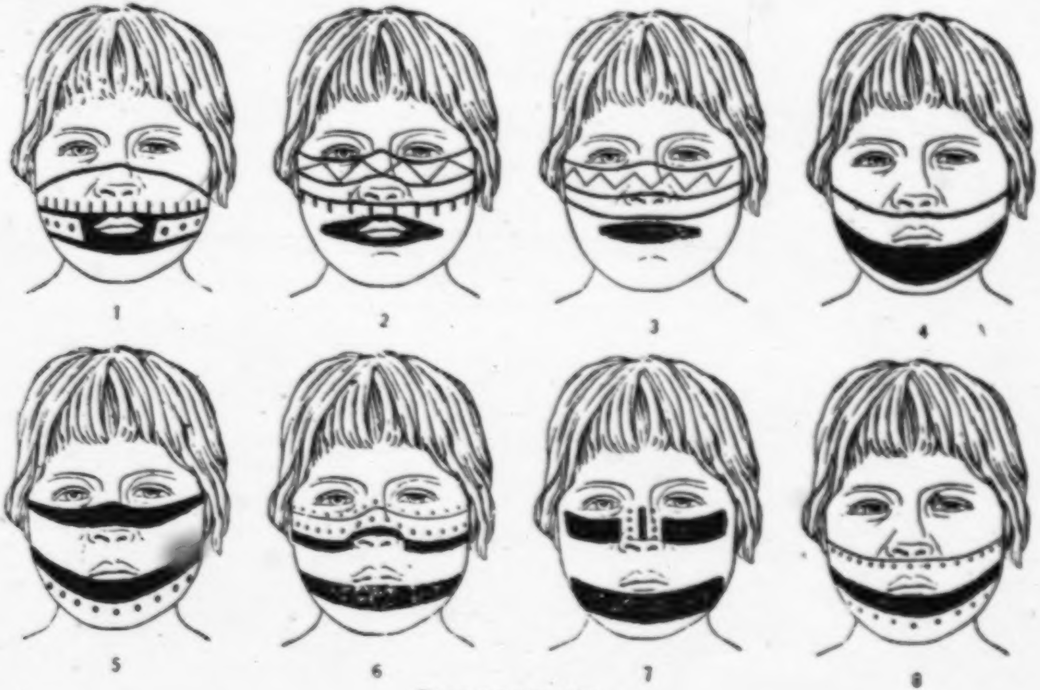

BARRETT—CAYAPA INDIANS
FACE PAINTINGS

[p. 619]



FACE PAINTINGS

[p. 68(c)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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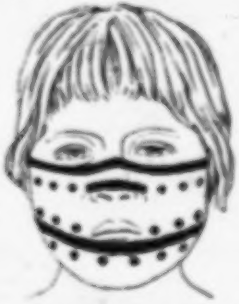

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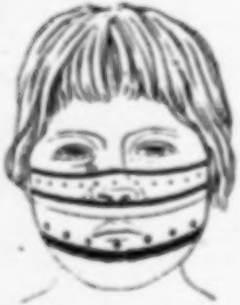

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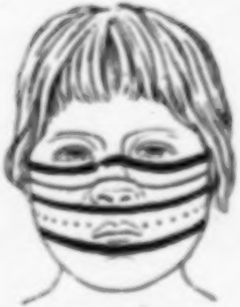

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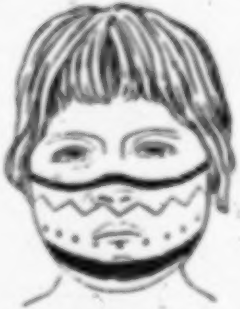

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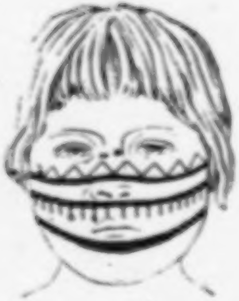

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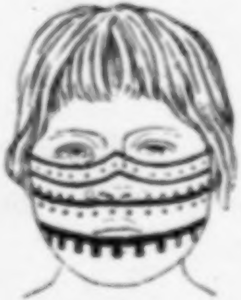

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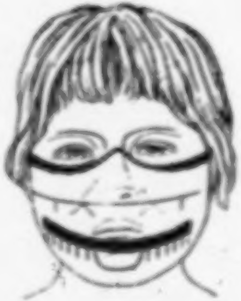

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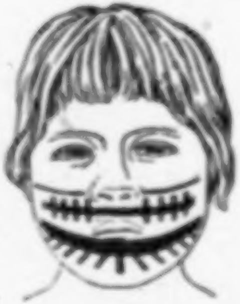

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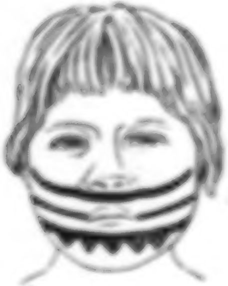
PL. XLIII

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

[p.68(E)]



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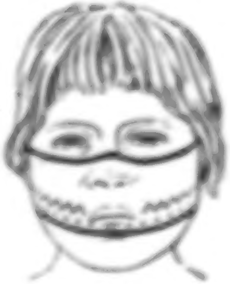

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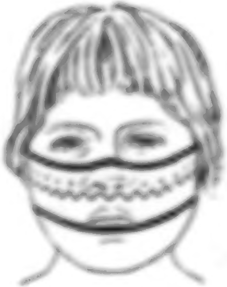

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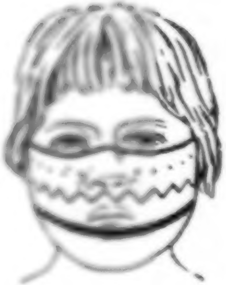

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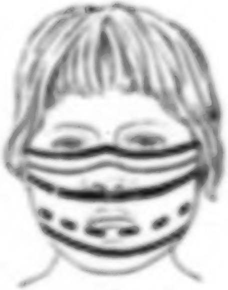

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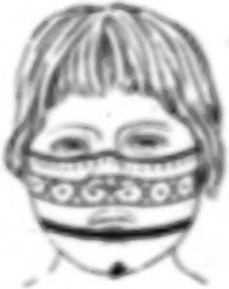

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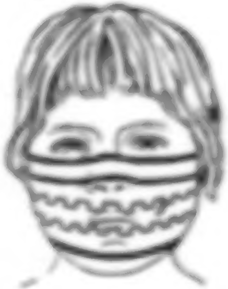

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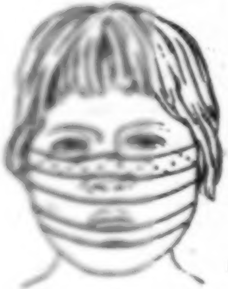

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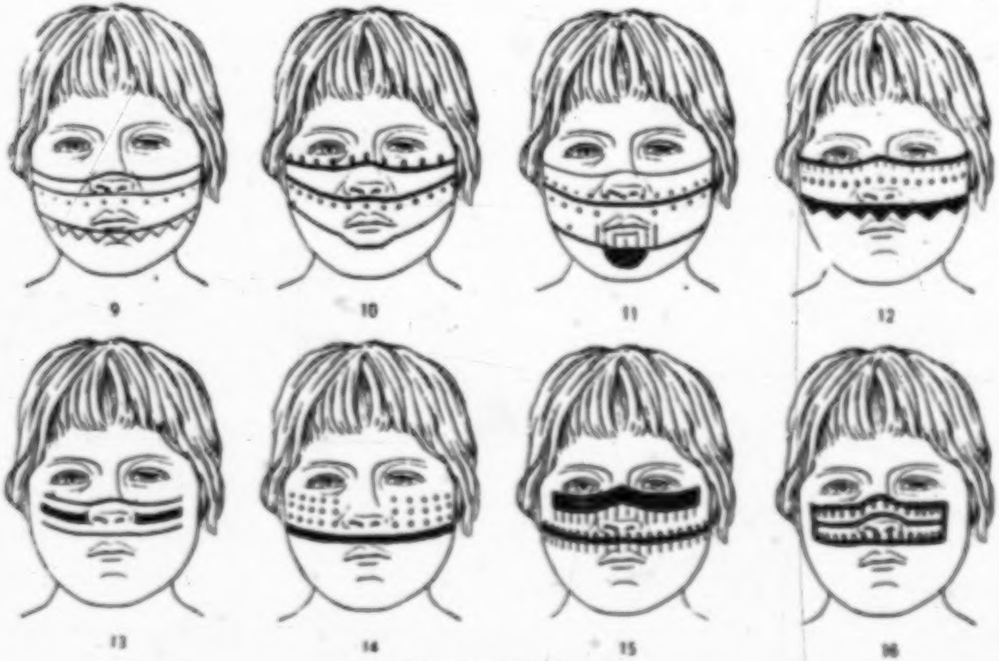
[p. 68(r)]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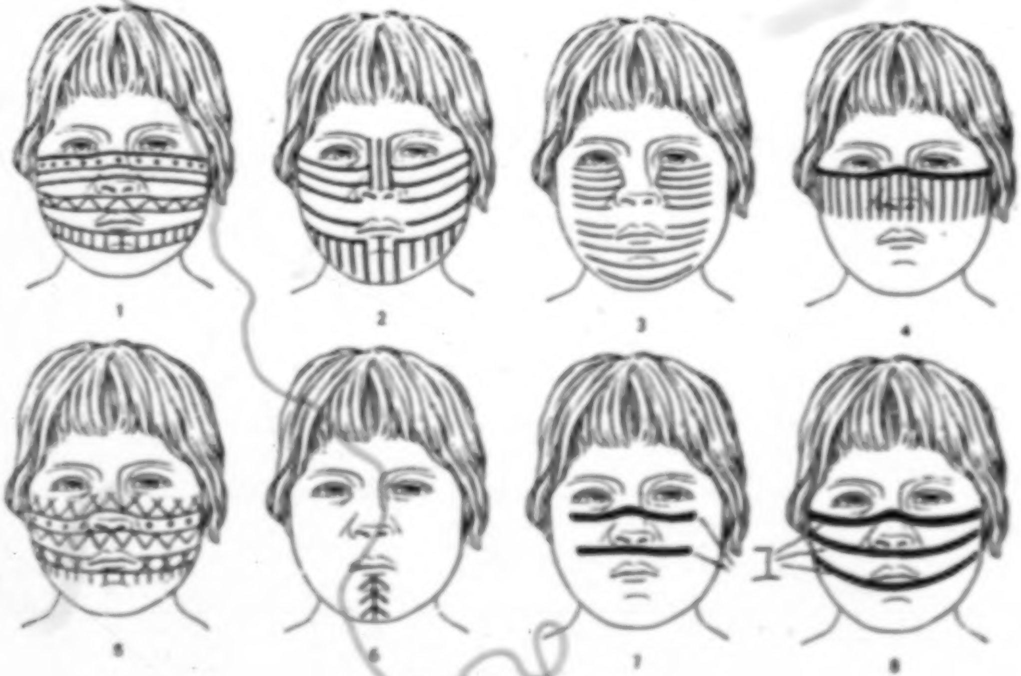
FACE PAINTINGS

BARRETT—CAYAPA INDIANS

PL. XLV



FACE PAINTINGS

[No. I indicates red color -- Analyst]
[P.68(6)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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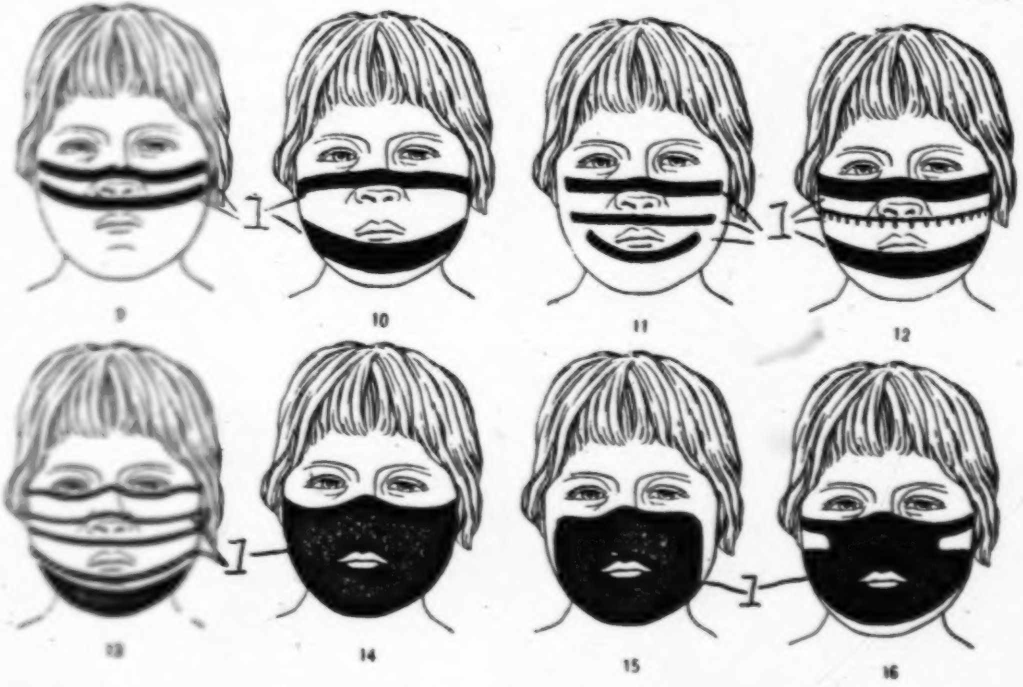
BARRETT—CAYAPA INDIANS

PL. XLVI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FACE PAINTINGS

[No. 1 indicates red color --Analyst]
[p.68 (H)]

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3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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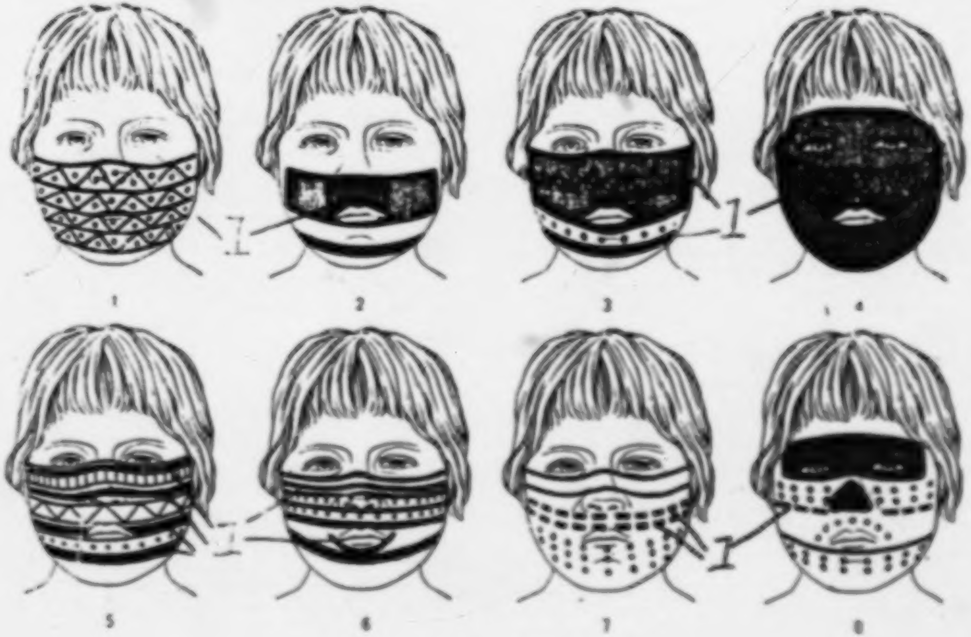
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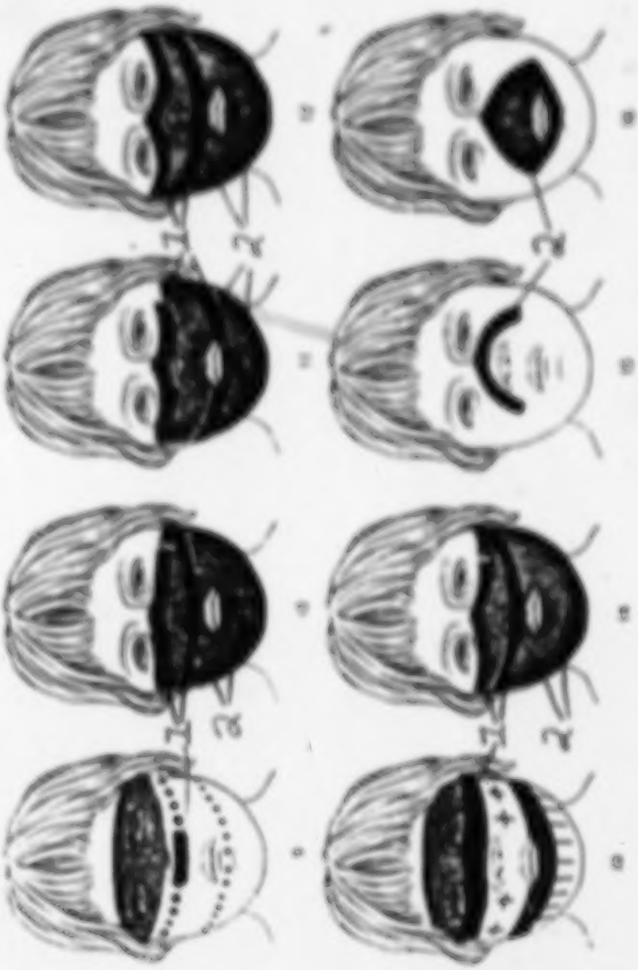
FACE PAINTINGS

[No. I indicates red color -- Analyst]
[p. 68(I)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

BARRETT—CAYAPA INDIANS

PL. [illegible]



FACE PAINTINGS

[No. 1 indicates red color, No. 2
indicates yellow color. --Analyst]
[p. 68(J)]

354 twisted string of pita, by means of which one of the older
[283] members of the family, while performing some other task, keeps the hammock swinging.

302 Aboriginally both men and women wore long loose hair, without braiding or other special mode of dressing; but now long hair is worn only by the women, the men keeping their hair cut short. Some of the women cut the front hair even with the eyebrows, otherwise their hair is never cut, nor is it dressed in any special fashion, being simply parted in the middle and allowed to fall loosely over the back and breast. The only time that the hair is ever worn otherwise is when a woman is engaged in some very hot work; it is then often coiled up on the head or tied in a large knot at the back. The hair of little girls is never cut, but that of boys is cut when they are very young. As a rule the men have no special mode of dressing the hair; it is simply kept cropped to an even length all round, and is allowed to grow from the crown straight down in all directions, without parting or other training. Now and then a man may part his hair in the middle, but this practice is exceptional. These styles of hair-dressing are shown in pls. XVI–XXXVIII.

A characteristic feature of Cayapa life is the custom of painting the face and other exposed parts of the body with red, yellow, and black pigment, and in many differ-
302 ent designs. The red and yellow pigments, called in
[illegible] Cayapa mũ' and la"mũ' respectively, are derived from the seed-pods of a small shrub known by the colloquial Spanish name achote and by the Cayapa name can-

302 629 yë'ö-tci. This achiote is of two different species, almost identical in general appearance. The seeds of one are surrounded with a yellow covering, those of the other with a red covering. When ripe, these pods are gathered, 303 the seeds removed, and the color drawn off by soaking the pods in water for a considerable length of time. This red or yellow liquid is then boiled down to a pasty consistency and mixed with any fairly hard fat, such as lard or the fat of the jaguar, the puma, or other wild animal. It is said that the viscous milky juice of a species of tree called sande is sometimes used instead of one of these fats; but the paint produced with it is not so good as that in which the fat is used. This 302 strong, greasy pigment is applied with either a small pointed stick, if small dots or narrow lines are required, or with a wide carved stick called mälpärpal'pa (pls. CXXI, CXXII) if a wide line is desired or if a considerable surface is to be colored.

302 624 The black pigment, called ma'lyä, is obtained from the fruit of a tree called ha'wä. This fruit, which is globose in form and from two to three inches in diameter, is gathered while green and cut in halves. The seeds and 303 the inner fleshy parts are then extracted and ground to pulp upon a mealing stone such as is used for grinding plantains. At the same time there is ground into the pulp a quantity of charcoal, and the result is a thin 302 black paste. When dots and narrow lines are desired, this paste is applied to the skin with a small stick tipped with cotton; but when a wide line is to be made, it is applied with a finger.

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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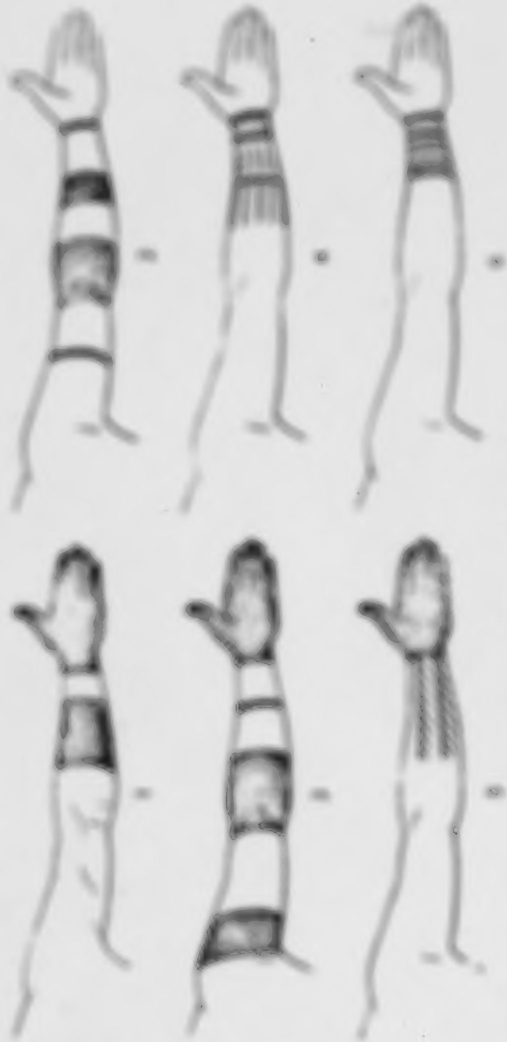


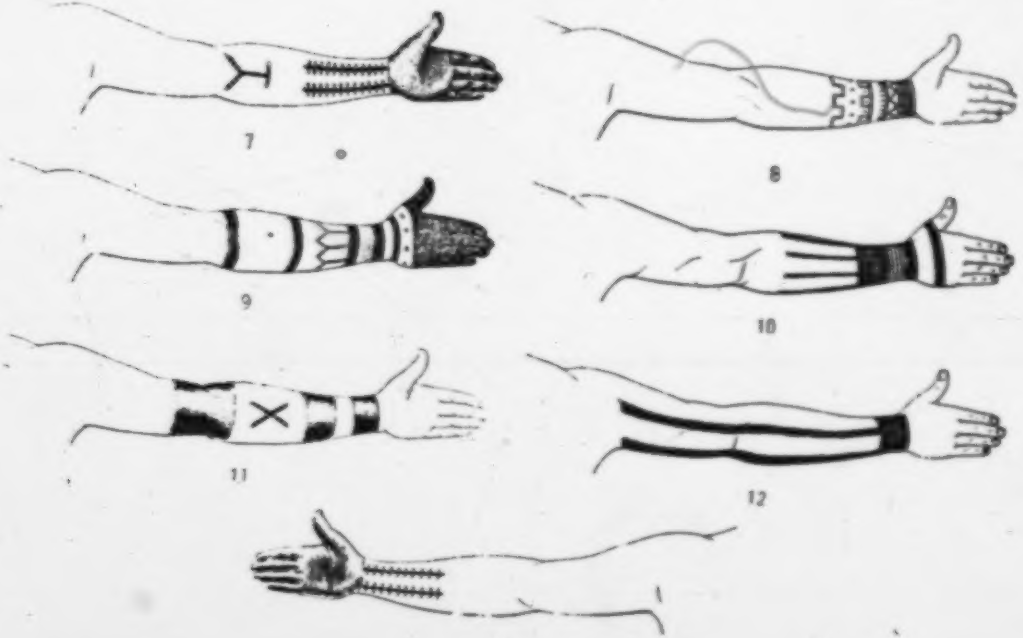
ARM PAINTINGS

[p. 70(a)]

BARRETT—CAYAPA INDIANS

302

PL. L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ARM PAINTINGS

[p. 70(B)]

3: Barrett E-5 (1908-1909)1925

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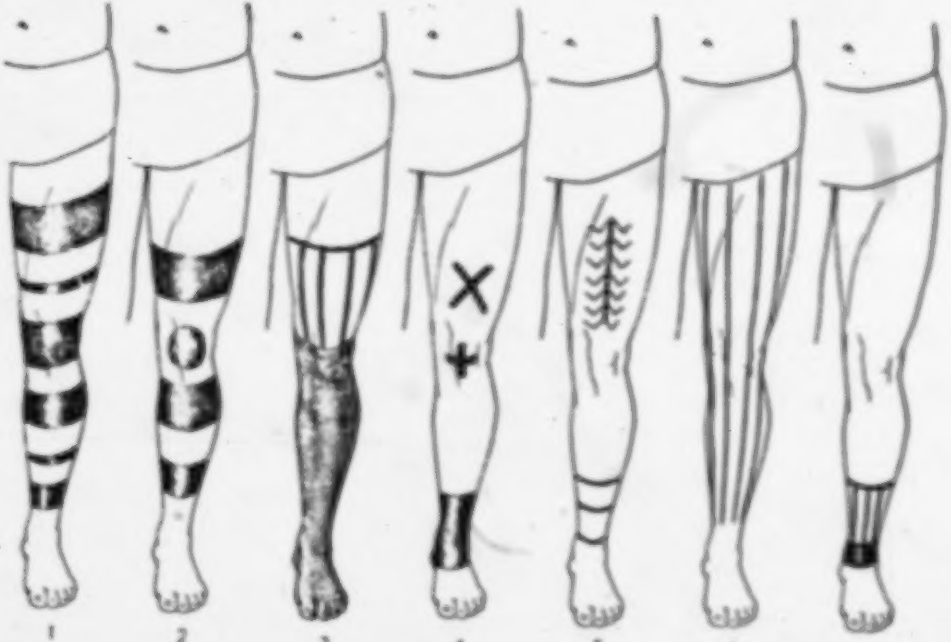
SD6 Cayapa SD6

[p. 70(c)]



LEG PAINTINGS

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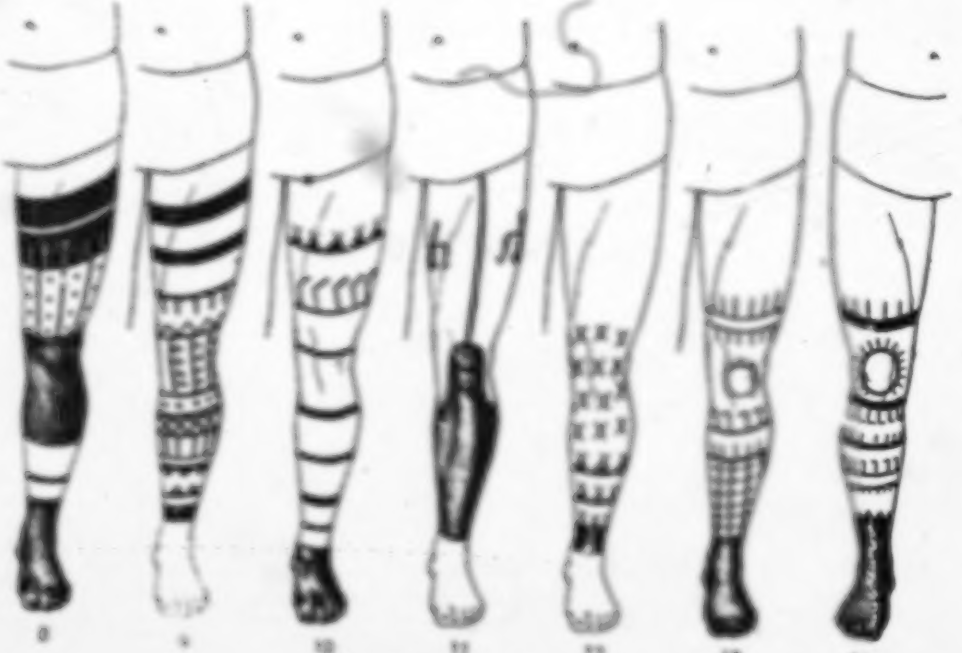
BARRETT—CAYAPA INDIANS

302

PL. LII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LEG PAINTINGS

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

[p. 70(a)]

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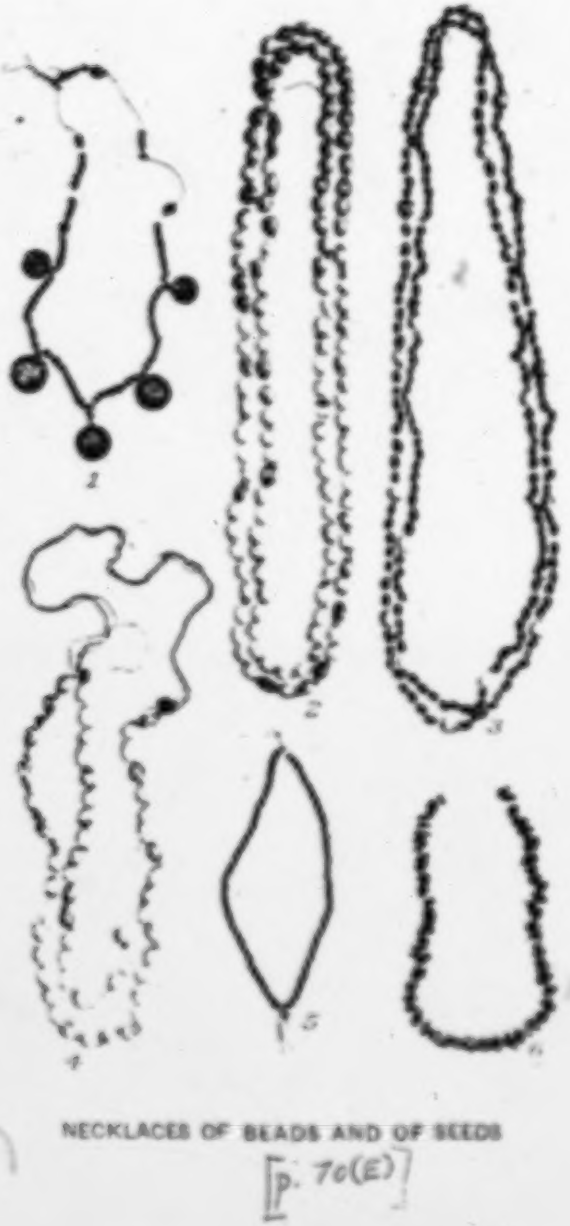

NECKLACES OF BEADS AND OF SEEDS

[p. 70(E)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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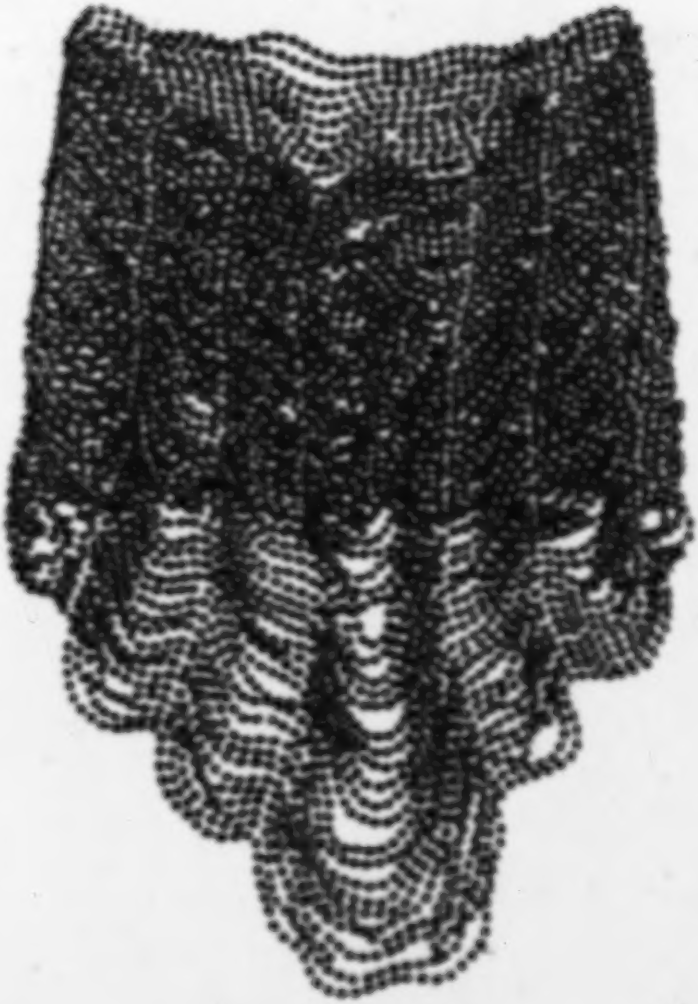
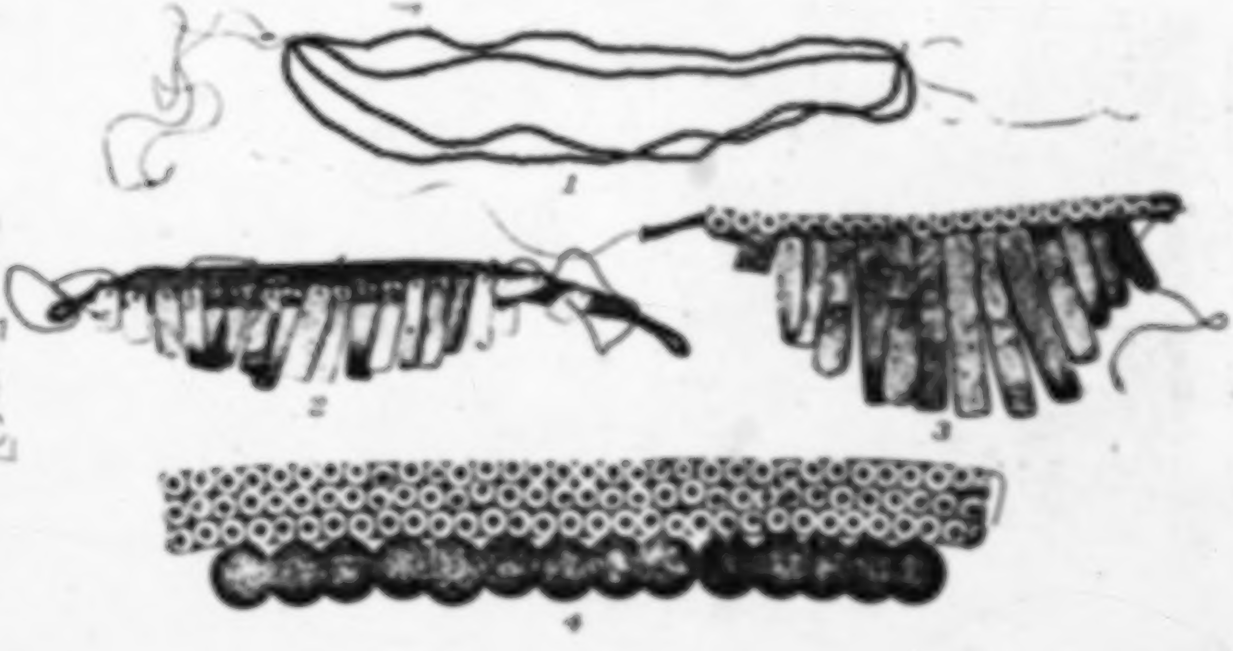


NECK ORNAMENT OF SEEDS

C

[p. 70(F)]



NECKLACES

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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[p. 70(a)]

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SD6 Cayapa SD6

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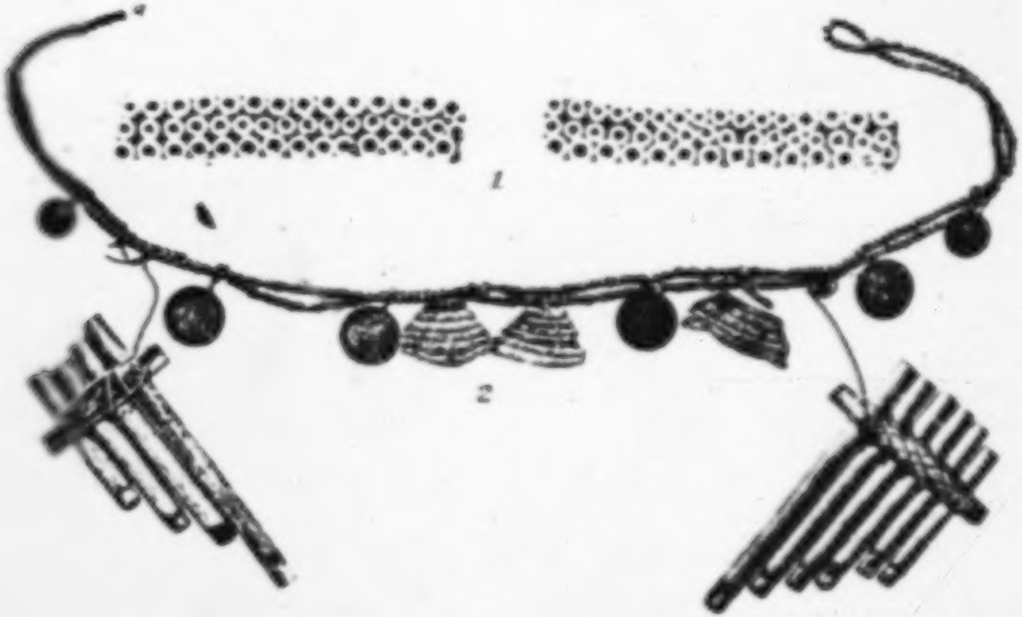

WRIST AND NECK ORNAMENTS

With these pigments, especially with the black, are 302
made a great variety of designs ranging from broad
bands to very fine dots and narrow lines. As is shown
in pl. XXXIX-LII, the designs employed in these face and
body paintings are of almost limitless variety and combination;
however, while the Cayapa have developed
this phase of personal adornment to such a degree,
they never recognize any special signification in the
designs employed. The designs, as those on mantas,
canoes, calabashes, and other decorated articles, are [531]
sometimes named, but in few cases was it found that
any of them were intended to be graphic, and in no
instance was any symbolic meaning attached to them:
they are regarded as merely decorative and have no
other special purpose. Furthermore, none of the [424]
designs is the particular property of any individual or
group of individuals, hence the greatest liberty is exercised
in their use; in fact, it is not uncommon to see
the same person change the designs on his face or body
from day to day during a fiesta, and there is no sequence
or other rule governing their use. Both men and women
thus decorate themselves, using a small mirror in painting
the face. In large measure, of course, the designs [177]
employed have been handed down from ancient times,
but now and then a person depicts upon his face or
body some new device taken from an article of modern
manufacture. Such a case is shown in pl. LII, 11,
where a modern three-pronged iron fish-spear is shown
painted on a man's leg.

## FOOD AND ITS PREPARATION

241 262 The territory of the Cayapa is abundantly supplied by nature with both vegetal and animal foods, the former being the more important. In addition, various introduced vegetal foods are now raised by the natives, the most notable of which are plantains, bananas, sugar-cane, yuca, pineapples, cacao, and sweet potatoes. There are also various introduced fruits, such as guabos, caimitos, sapotis, papayas, and, to a limited extent, cocoanuts. In addition to these, many species of wild plants and trees yield foods; especially is this true of the palms, such as chonta dura and palma real.

224 262 The jungle abounds in a great variety of mammals and birds, most of which furnish food for the Indians. The mammals mostly used are the guanta and the guatin, two large species of rodents, the peccary, the wild-hog, the deer, the jaguar, the puma, the ocelot, a small species of red squirrel, a large species of wood-rat, the sloth, the ant-eater, and the armadillo. The birds most used as food are two species of grouse, two species of wild turkey, two species of toucan, and several species of dove. The rivers abound in various kinds of fish, several of which are eaten by the Cayapa. A species of lobster is also plentiful in the streams, and there is a very small mussel-like bivalve which is consumed to a limited extent. Reptiles of all kinds are shunned, although the boa and certain other species of large serpents occur in the region. The iguana and its eggs are much prized as food, and numbers of these large lizards are taken in the season when they come down

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

OYSTER-SHELL KITCHEN-MIDDEN

[p 72 (P)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

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[illegible]

[illegible]

to the river to lay their eggs. The large eggs of the alligator are also much in favor, and it is said by some that alligator flesh is edible. The eggs and flesh of another and slightly different species of amphibian, called tulicio in the local Spanish, are likewise used for food. In addition to these foods there are certain insects which, either full-grown or in the larval state, are much esteemed. 224 262

Various methods are employed in the preparation of these foods. The plantain, the most important food product of the Cayapa, is prepared in a variety of ways. It is almost invariably gathered while green, and is regularly eaten in that condition, though ripe plantain is frequently used for making a kind of gruel, and occasionally it is roasted. The usual method of preparing the green plantains is by boiling, the outer covering of the fruit having first been removed. They are thus cooked for from a half to three-quarters of an hour in a pottery vessel, or nowadays more frequently in an iron or a granite-iron kettle, closely covered with a green leaf called ß'tya hakl, which is very tough and is used in many ways in the preparation of food. It is impossible to cook green plantain so that it is tender, hence the usual mode of preparing it is to beat the hard, cooked fruit with a stone muller upon a mealing stone (pl. LXIII, 1, 2), mixing and kneading it meanwhile with the hand. Usually this beaten plantain, which is called bala, is eaten without seasoning, although a little salt may be added; or it may be mixed with dried meat during the pounding. The boiled green plantain is also frequently eaten without 252 [315 177] [263]

252 pounding. The ripe plantain, on the other hand, is generally prepared, after boiling, by macerating with a wooden [245] masher, matci'ka, in a wooden bowl, called batea in Spanish. In pls. LXI, LXII these implements are shown, the masher appearing in pl. LXI, 1-5, and the batea in pl. LXII, 6. In this form the plantain will keep for three or four days, and is a nourishing, concentrated food. [264 It is, however, never eaten in this form, but is diluted 272] with water into a very thin gruel, which is drunk more as a refreshment between meals than as a regular food. The plantain mash is also carried on short trips into the mountains or along the river, and is made into gruel as needed.

Both green and ripe plantains are also roasted over coals, the ripe ones generally with the outer covering, the green ones usually without it. When thus cooked also, the green plantain is preferred to the ripe. It is ordinarily roasted until quite dry, when it is mashed on the mealing stone with the muller. The pounding in this case is not the same as in making bala—the plantain is merely mashed flat, without any mixing with the hand.

Still another method of preparing green plantain, but one that is not applicable to the ripe fruit, is the making of a kind of tamales. With a small shell the plantain is scraped to a mushy consistency, and, after [263] the addition always of a little salt and sometimes of pounded meat, fish, or certain species of insects, is rolled into a long, slender cylinder, covered with the tough green leaf, ä'tya baki, before referred to. This preparation is then roasted before the fire for some

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

245

PLANTAIN FIELD

[p.79(d)]

246
501
535

HARVEST OF PLANTAINS

[p. 74b]

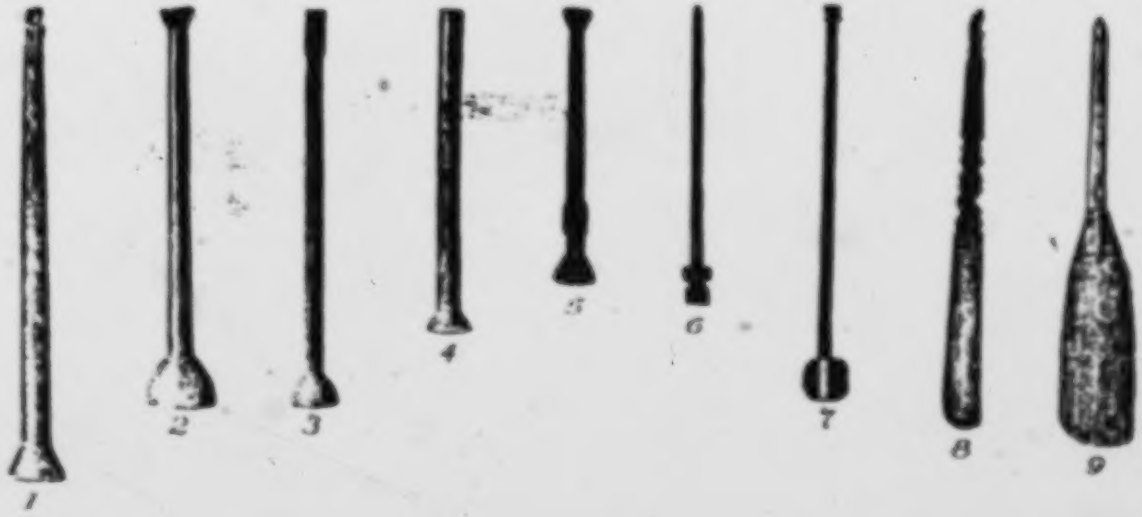
minutes, usually until the leaf covering is largely, if 252
not entirely black. The covering is then removed and
the tamale eaten in that form or after being mashed
flat upon the mealing stone. When obtainable, a
species of large black beetle (*Rhynchophorus palmarum*), [325]
called kū'perū, is used as one of the ingredients in the
making of these tamales, and it is said by the Indians
to be one of the most toothsome of all their foods.

The method usually employed in preparing other
vegetal foods, such as yuca, sweet potatoes, etc., is by
boiling in the ordinary manner. Meats and fish are [415]
generally boiled in pottery vessels without the covering
of leaves above mentioned, and they may also be broiled
or baked. Broiling is done in the ordinary manner,
by simply placing the food over the fire. In baking,
however, a special method is employed. After being
properly prepared and cut into small pieces, the meat is
wrapped in two thicknesses of the tough green leaf
above mentioned. The flat package thus formed is
then placed upon the coals, and hot ashes and coals are
heaped upon it. Several minutes are usually needed
for this baking, and sometimes it is necessary to replenish
the coals or to turn the package over to insure
proper cooking. This method is much employed in
cooking all kinds of meats, fish, shellfish, and crabs and
other Crustacea.

In this warm, humid climate, where meat keeps but 251
a very short time, drying and smoking over the fire is 352
much employed by the Cayapa when any considerable
quantity of meat or fish is on hand. For this purpose

251 special racks are built above the fire-box, where strips of
352 meat, or, if the animals or birds are small, the entire
bodies, are placed to dry and smoke. Sometimes there
are as many as three of these racks, one above another,
each covering the same amount of space as the fire-box
251 itself. Considerable time is necessary for drying meat
in this way, and, when once dried, it must be kept either
on the racks or near the fire in order to prevent molding.
For drying fish there usually is employed the upper half
of a large earthenware jar, which is turned down over
the fire and the fish laid across the opening upon green
sticks. Being thus close to the fire, a shorter time is
sufficient to dry and smoke the fish, but when thus
cured they also must be kept on the racks above or
elsewhere near the fire-box in order to keep them from
[278] molding. A few vegetal products, especially medicinal
herbs, are dried in a similar manner, as likewise are two
vegetal foods. The inner covering of the tagua or ivory
[262] nut, which, when dried and then roasted upon the coals,
has an excellent flavor, is used as food to a slight extent.
Green plantain is cut crosswise into thin sections and
dried thoroughly in the sun, when possible, or over the
[853] fire when necessary. It is then ground to powder and
mixed with water into a thin gruel, which is used as food
for babies when the mother is ill or for other reasons is
unable to provide a proper supply of milk.

252 Boiling is employed also in the preparation of certain
vegetal foods in cane juice. While practically all the
product of the cane-field is used in making rum, some
syrup and sweets are occasionally prepared. Yuca and



MASHERS, CHOCOLATE STIRRERS, AND FOOD PADDLES

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

[p.76(A)]

415

PL. LXII

252/415

3: Barrett E-5 (1908-1909)1925

SD6 Cayapa SD6

[p.76(8)]

MEALING BLOCK AND STONES, AND WOODEN TRAYS plantain or other fruits are cut into fairly small pieces 252 and boiled in the cane juice during the process of reducing it to syrup, thus producing a rich and toothsome conserve. Much labor is entailed in making this delicacy, but it is rarely prepared except as a secondary product of distillation.

A rather rare food, and one much prized by the 262 Cayapa, is a large white, brown-headed grub, called kō′mucū, which is found in rotten trunks and stumps of fallen palms. Their presence is easily detected by their low, crunching sound as they eat the tough palm fibers within. Such a log is cut open and the grubs are carefully taken out, along with a considerable quantity of the rotted palm-wood. They are usually placed in burden-baskets and then stored in the house in a closely-covered olla until needed. The grubs have a very tough skin, and contain a considerable quantity of rich fat, resembling lard, which is used by the Indians in several ways. The kō′mucū may be eaten raw, but 252 more frequently it is broken open, placed over the fire in a small pottery vessel, and fried in its own fat, so to speak, resulting in a very rich oily food. Another favorite method of preparing this food is to mash and make into a gruel some boiled ripe plantain, which is stirred into a pot of kō′mucū that has been made to boil with a small quantity of water. Most of the kō′mucū used in making this dish are left whole, but a sufficient number of them are broken to liberate a considerable quantity of fat into the receptacle. The result of this process is a rich food of the consistency of gruel, and it is relished, perhaps, above all others.

226 The Cayapa make frequent journeys to the ocean, chiefly for the purpose of securing shellfish and crabs, which are abundant along the beaches about the mouth of the river. There are several species of clams and mussels, as well as oysters in large numbers. Also crabs of several species are very abundant, and are captured usually by digging out their burrows. Both the shell- [482] fish and the crabs are brought alive up the river, the crabs being confined in coarse baskets. Oysters are 252 usually heated over coals sufficiently to cause the shells [263] to open, and are eaten directly from the shells with a bit of salt or lemon; but clams and mussels are generally boiled. Crabs also are almost always boiled, although sometimes they are roasted.

226 Inland, along the banks of the Rio Cayapas and its tributaries, are obtained three other foods of the same class. In the wet soil of the jungle live large numbers of a small, bright-red land crab, called nĕ'lŭ, or, more specifically, kaia'pa nĕlŭ. This crab has one very large [252] arm, which is the only part used as a food. The crabs are caught in great numbers, and the large arm is removed and roasted. In the waters of these streams are also large numbers of a small species of lobster or crayfish, called pi'cŭ, which is considered an excellent food. [227] It is caught with a special dip-net, called cia, used almost exclusively for this purpose. The third food of this class is likewise obtained from the rivers. It is a very small bivalve, resembling a miniature mussel such as is found in the ocean, and is gathered at certain points along the streams where the rock walls of the banks or where bedrock affords convenient lodgment.

## AGRICULTURE

As before stated, the Cayapa practise agriculture to such an extent that it may be considered their chief occupation, for by it are produced their chief food supply and also certain materials used in textiles. Under agriculture should be classed not only the introduced domesticated plants, but also certain indigenous vegetal growths which are cared for to a greater or lesser extent. These various products are in large measure raised for consumption by the Indians themselves, but some are sold in the settlements at the mouth of the river. 241 [439]

The regular Cayapa dwelling, as before stated, is situated near the bank of the river, and is almost always flanked, usually on both sides, by clearings and fields. Plantains, bananas, sugar-cane, cacao, cotton, yuca, rascadera, pineapples, yams, tobacco, corn, coconuts, rubber, and certain herbs are grown by the Indians. The first five of these are almost invariably found in the fields immediately adjacent to the house. Some [18] of the other products mentioned, such as yams, corn, coconuts, and yuca, are not raised by all the Indians, and rubber is more frequently grown at some distance from the house, as it thrives better under special soil conditions. In addition to these nearby fields, frequently a favorable location for more or less extensive plantings in the hills is found along the banks of some estero and at a considerable distance from the river. By some of the Indians it is claimed that the plantain grows better at some distance from the main stream, as does also "pita," the plant which yields the tough

241 white fibers used in making one kind of string. In all cases, however, such fields are comparatively near some stream, thus enabling those who cultivate them to travel back and forth in canoes and to transport readily the product of the fields to their homes.

245 The most important vegetal product of the Cayapa fields is the plantain, the uses of which as a food have already been discussed. The plantain, like the banana, is grown from root-stocks, never from seed. After the planting of one of these root-stocks, nine to ten months of growth are required before the first racime of fruit is harvested; but while the stalk bearing this first racime is coming to maturity, several small shoots from the parent root-stock are developing, so that within a few weeks after the harvesting of the first racime a second is matured, and so on indefinitely. Thus when a field of plantain is once established, it practically never needs replanting, provided, of course, it is properly tended and cleared of the rapidly-growing brush and weeds. Each root in such a field will mature a stalk and a racime of fruit about once every four to six weeks the year round, there being practically no seasons or seasonal changes in this region. A stalk bears but a single racime, and this is so heavy that, as the young fruits make their appearance, a prop is always placed against the trunk of the plant upon the side on which the racime hangs. When the fruits are well filled, but while they are yet green, the entire stalk is chopped down with a machete. This is done for the reason that the stalk bears but a single racime and would therefore naturally die after

the ripening of the fruit, and also to facilitate harvesting the heavy racime of fruit, which is usually from ten to fifteen feet from the ground. The fruit having been removed, the trunk is chopped up and rolled away from the newly growing shoots. Owing to its succulent character and to climatic conditions, the trunk decays rapidly.

Being the chief food of the Cayapa, plantains are grown in considerable quantities, often a single family having a field covering several acres. It appears, however, to thrive better in some places than in others. For instance, in the region about Punta Venado the land is comparatively low and wet, and complaint is made that the plantain does not do well. Along the Rio Onzole, on the other hand, better conditions are said to prevail, the land being somewhat higher and having better drainage.

The fields of plantain are in large measure tended by the women, though the men frequently assist in clearing the fields. The harvesting is done almost entirely by the women, who cut down the stalks as above mentioned. They strip off a wide band of the bark from the midrib of one of the large leaves, which they use as a head-band in carrying the racimes of fruit from the field to the canoe, thence to the house. As before stated, the plantain is always gathered while green. Even if ripe plantain is desired, it is usually gathered green and allowed to ripen indoors. The gathering of the plantain while green is, first of all, a matter of necessity, since if it were left in the field to ripen it would be devoured by parrots,

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

24 rodents, and bats. Furthermore, the plantain has a much superior flavor when gathered green and ripened in a shady and fairly cool place. If allowed to ripen on the plant, the Indians claim that it is insipid.

The banana, which in some respects can hardly be distinguished from the plantain, is cultivated and harvested in precisely the same manner. Of this fruit
[249] there are three species: a large yellow, a small yellow, and a small red species; but they are almost never used as human food, being cultivated in nearly as great quantities as are plantains for the purpose of feeding the hogs, of which the Cayapa raise considerable numbers.

249 Sugar-cane, though introduced, has a native Cayapa name, e'lla, and is one of those products at present most grown by the Indians. Often immediately adjacent
27 to the dwelling, and always within a short distance of
31 it, is a cane-mill and distillery, called tapi'tci ya or ta'pi ya, usually surrounded by comparatively large fields of cane, which thrives especially in low, wet ground. In pls. I, II, are shown cane-mills which are immediately adjacent to the houses of their owners, and to the right in each case glimpses of the adjacent cane-fields may be had. In pl. VI is shown an isolated mill, flanked by its field of young cane. This mill is situated directly across the river from the dwelling of its owner.

249 After the original planting, a few months only are required before the cane is sufficiently mature to be cut. There are no regular times for the harvesting of the cane, which is usually governed by the necessity for a new

supply of rum. When it is deemed best to replenish 249
the rum supply, the whole family goes to the cane-field,
and each with a machete and a hooked stick about three
feet long, clears the field of all weeds and vines, and
cuts as much of the matured cane as is needed. The
stalks of cane are always cut close to the ground, and
all the leaves are stripped off. The butt end of the stalk
is then cut diagonally so as to leave a markedly beveled
point, which facilitates its insertion between the rollers
in grinding. This beveled cut is well illustrated at the
lower end of the stalk of cane shown in pl. xv. This is
a picture of Antonio Napa, or Pi'tcü apa according to
his Cayapa name, chief of the Punta Venado division
of the Cayapa, at work in his cane-field, and exhibits a
field of cane in process of harvesting. All the cane
leaves which are stripped from the stalks, together with
the vines and undergrowth, are carried to the side of the
field and thrown into the brush, since if they were left
on the ground, the vines especially would soon take root
and grow as rapidly as before. As the mill is ordinarily 274
immediately adjacent to the field, the cane is carried to it
usually upon the shoulders of the harvesters. If, how-
ever, it is situated at a distance of several hundred yards, [482]
the cane is generally carried to the bank of the river
and thence transported by canoe to the mill. The stalks,
cut usually into lengths of from four to six feet, are piled
in a large rick in front of the rollers used for grinding.
As shown in pl. LXIV, the cane may first be corded up on
the ground in front of the mill, and later put on the
floor in front of the rollers.

27 The "mill" proper, called tapi'tci, from the Spanish trapiche consists of two heavy rollers, usually about fifteen inches in diameter by thirty inches in length. These rollers, which are called by the same name as the entire mill, are set horizontally in a heavy upright frame and are usually at a height of about four feet from the floor. The upper roller is the continuation of a heavy squared shaft, from ten to fifteen feet in length, at the opposite end of which is a large wheel, called tapi'tci lyú'mi, sometimes as great as sixteen feet in diameter. This wheel as a whole really consists of two wheels of equal diameter which are set at a distance, along the horizontal bar, of from two to three feet from each other. Each of the separate wheels comprising the large wheel consists of spokes in the form of cross-bars that pass through the squared shaft and at right angles to it, and of a rim made from one of the many species of large vines common to the region. The rims of these component wheels are joined by many horizontal bars which complete the wheel as a whole and which serve as hand-holds in propelling the wheel. The upper and lower rollers have in turn each a set of cogs by means of which, when the upper roller is turned by the force exerted upon the wheel, the lower one is turned correspondingly in the opposite direction, thus drawing the cane between them and crushing it. Usually several persons are required at the wheel in order to drive the rollers. One person, usually a woman or a child, feeds the cane into the rollers, and another receives the cane on the opposite side. A single stalk of cane is fed at a

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

UTENSILS FOR MAKING RUM

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[p.84(b)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

274

SUGAR-CANE STACKED BESIDE THE MILL

[illegible]

279 [415] [50]

time, and each is followed immediately by the beveled point of the next stalk. Below the rollers and between the uprights which support the whole mechanism is placed a large canoe-shape wooden trough such as that shown in pl. xxiii, or in pl. xxv, into which the cane-juice flows. In case there is no such special wooden trough at hand, or the regular trough is otherwise in use, a small canoe is carefully washed out and used instead. When necessary, leaves of the hoja blanca or of the plantain are placed at the sides of this receptacle in order to prevent the juice from falling or splashing outside. These leaves are especially necessary when, as occasionally happens, a large pot instead of a trough or a canoe is used as a receptacle for the juice; in such an event a funnel is usually built up with leaves above the mouth of the pot.

When the whole rick of cane-stalks has been ground in this manner, the motion of the rollers is reversed, wedges are driven into spaces above the bearings of the uppermost roller in order to bring the two rollers more closely together, and the cane is rolled a second time. During this part of the process, however, two or three of the previously crushed stalks are placed one upon another and almost as much juice is pressed from each as was obtained in the first rolling. As the stalks are received from the rollers the second time, they are quite devoid of juice and are thrown out on the ground. Thus in front of each mill is heaped a large mound of cane trash, such as that shown in front of the mill in pl. vi.

During the grinding of the cane a large copper kettle,

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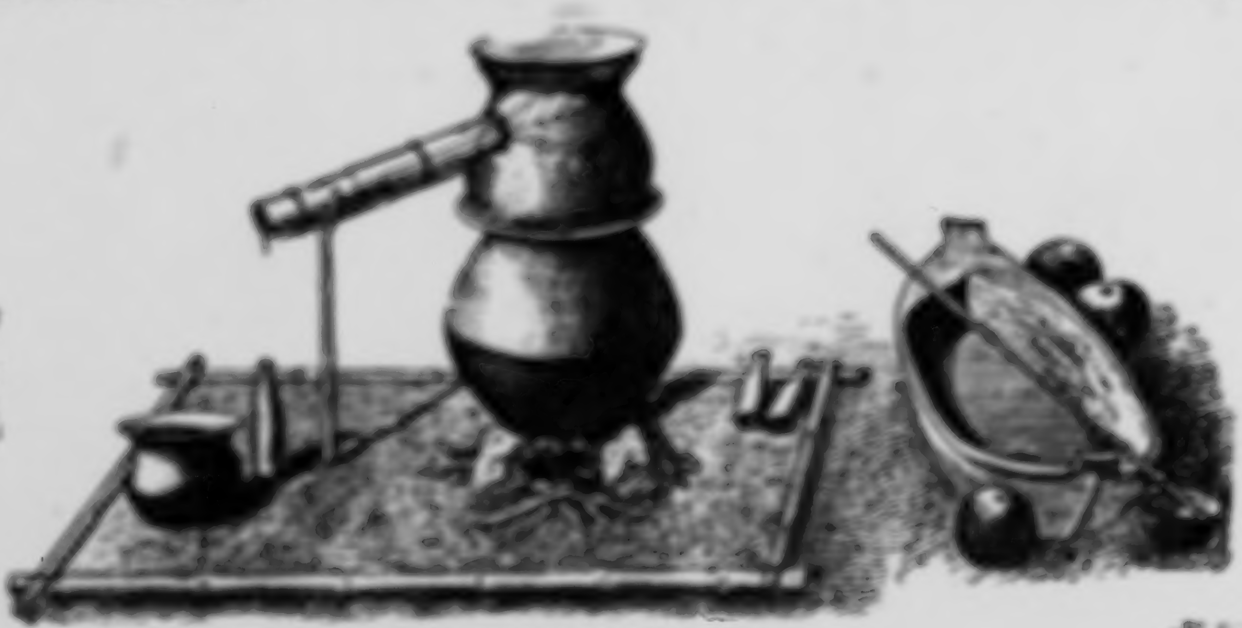
called pai'la, is kept filled upon a fire in another part of the building, and the juice is here boiled as rapidly as it comes from the rollers. This boiling is allowed to continue for from ten to twenty minutes, during which time the froth which rises to the top is skimmed frequently with a special perforated dipper or skimmer, usually attached to a long handle and called ci'ribya, or with a large calabash spoon called ci'li-kucada, the latter part of which term is from the Spanish cuchara, "spoon." When the juice has reached the stage where it boils without producing froth, this part of the process is considered finished; it is then dipped out of the kettle with a long-handled calabash dipper like that resting across the end of the canoe-shape wooden trough shown in pl. LXXIII, and that in pl. LXV, and called ni'mbä or i'shala pi ci'lbuntelami, and is placed in one of the large canoe-shape wooden receptacles above mentioned, where it is allowed to cool for several hours. When thoroughly cooled it is put away to ferment in large pottery vessels, or ollas, of the form shown in pl. LXXXVIII, 11. Several thicknesses of the leaf of hoja blanca are placed over the opening of such a pot and tightly bound about the rim. The juice is then allowed to ferment for from two to three weeks, when it is ready for distillation. The boiling and subsequent cooling of the juice before placing it in the ollas is said to be necessary to prevent souring.

Usually a sufficient quantity of the juice, called by the Spanish name guarapo, rendered wa'pä in Cayapa, is prepared at one time to fill several large ollas. While

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

[p. 246]



STILL, CANOE-SHAPE DISH, AND DIPPER

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316

283
342
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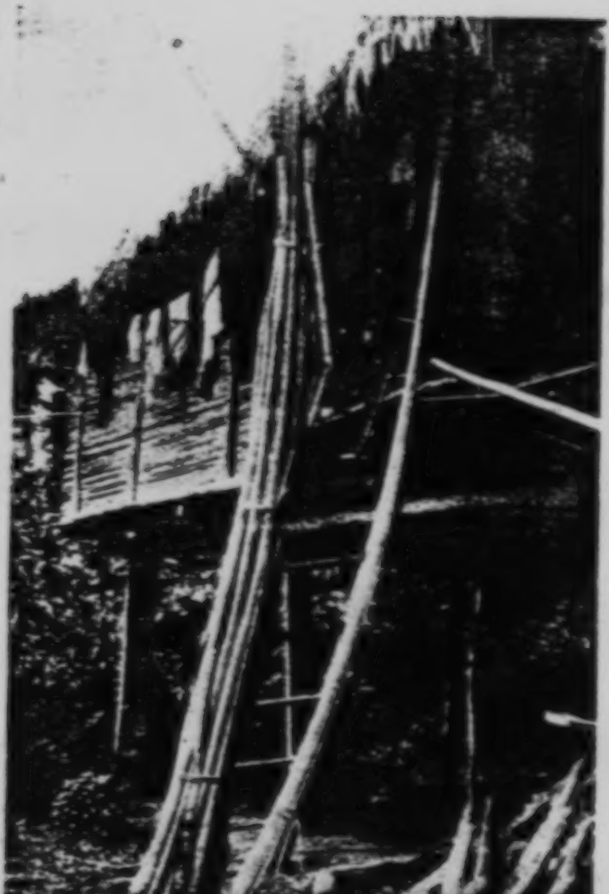

PITA LEAVES FOR MAKING CORD

[p. 86(B)]

fresh from the rollers, as well as after boiling, in fact at 274
any stage before it begins to ferment, the juice is called pi′ wapū, literally "water guarapo," in contradistinction to the fermented juice, which is called sa′wapū, meaning "sour guarapo." The ollas referred to are especially [415
made for the purpose, and are the most difficult work of 323]
the potter, as their size renders them not only inconvenient to form and handle while drying, but makes them also extremely hard to fire. They are almost invariably [237]
coated inside and out with brea (Cayapa, amū′ya), the wax of a small bee, which renders them impervious and prevents waste through seepage. The bases of these large vessels are comparatively small, therefore to prevent them from tipping, each is set upon a ring made of refuse cane. When sugar-cane was first introduced 273
among the Cayapa, rum was not made, but the fermented guarapo was much drunk, and even at the present time considerable quantities are so used. To be sure, it is by no means so intoxicating as rum itself, but after it has fermented for two to three weeks it contains a considerable proportion of alcohol. The fermented guarapo is drunk not only about the home and during the process of distillation, but also to a certain extent at fiestas, to which it is brought in large ollas and consumed in place of rum and by some in preference to it.

The guarapo is finally distilled in order to produce the 274
concentrated alcoholic beverage known by the Spanish [273]
name aguardiente and called by the Cayapa i′ckala. The still used in this final process is illustrated in pl. LXIII, from a photograph made while the distillation was in

274 progress, and in pl. LXV from a drawing so made as to show the wooden "worm" as well as the outside of the still. Such a still is composed of five parts. Three of these consist of (1) a large olla of the form shown in pl. LXXXVII, 7, which serves as a caldron and which is supported over the fire by three stones; (2) a second olla or vaporizer which surmounts the caldron and which is of the form shown in fig. 10 of the same plate; and (3) a flat, inverted cone of copper which rests in turn upon the vaporizer. This copper top, called i'ckala lanō pai'la, as also the large copper kettle used in reducing the cane juice by [439] boiling, is obtained through trade. These appliances are manufactured chiefly by metal-workers in Quito, and both are highly valued by the Cayapa largely because of the difficulties of transportation from Quito to the Rio Cayapas. The upper olla, or vaporizer, called kandyīhū'lū, is without a bottom and therefore forms a large chamber into which the vapor from the boiling guarapo in the caldron below rises and comes into contact with the inverted copper cone, which is kept constantly cool by frequently changing the water in it. The vapor condenses on the under surface of this copper vessel, runs down to the point of the cone, and drips on a flat grooved board, called kandēlē'hō or kandyīhūlū ta"pa, which forms the fourth element of the still, and which serves in a way the same function as the worm in the still used by civilized peoples. Its position and its relation to other parts of the still are well shown by the drawing in pl. LXV. This "worm" conducts the liquid out through an opening in the side of the vaporizer and

**3: Barrett E-5 (1908-1909)1925**
**SD6 Cayapa SD6**

part way through a bamboo tube, called i'ckala lanõ pa'kkį, the fifth element of the still, down which the liquid finally runs to a small bit of cotton at its outer opening. E 14 This cotton is brought to a point at its lower end and serves to conduct the liquid directly to a receptacle, usually a bottle, below. Quite naturally it is necessary that the entire apparatus have joints which are practically air-tight in order that the vapor shall not escape. To effect this, all the joints are filled with scraped, green plantain, which, becoming heated as the caldron begins to boil, firmly cements the parts of the still together.

This apparatus for distillation requires constant attention. The fire must be kept carefully under the caldron and must be neither too hot nor too cool. If too hot, the guarapo will boil up into the vaporizer and pass out through the tube; thus in a few seconds a bottle of rum may easily be spoiled by being mixed with a small quantity of the guarapo. Also, the water in the copper top must be changed frequently in order to keep the top itself cool enough to condense the vapor on its surface. Water is kept usually in a large canoe-shape wooden receptacle near the fire-box, as shown in pl. LXV. The long-handled calabash dipper, above mentioned, is used to remove the heated water from the copper top and to replenish it with cold. When care is exercised in the boiling and the cold water is replenished at proper intervals, the rum passes down the cotton tip into the receptacle in a small but constant stream. A caldron containing from ten to fifteen gallons of guarapo yields from four to six quarts of clear liquor and requires from two to three hours in its distillation. This liquor is as clear as water, has a very pungent odor, a vile flavor, and contains from ten to twenty per cent of alcohol. The distillation of four or five caldrons of guarapo is considered a good day's work.

According to Cayapa belief, the success of a distillation does not depend entirely on the care with which the boiling is done. In transferring the guarapo from the storage pots to the caldron, a small pot, such as that on the fire-box shown in pl. LXV, with a capacity of a gallon to a gallon and a half, is used. With a hemispherical calabash dipper, or mate, such as that shown in fig. 13, the guarapo is first dipped from the storage pot into this smaller vessel and is then carried to the caldron. The pouring of it into the caldron, however, is a most important matter, since certain people have "much better hands" than others. That is to say, if the guarapo is poured into the caldron by a person with a "good hand," the yield of that caldron may be increased even as much as two or three quarts of rum over the yield resulting if it is poured by someone else. It is a common practice to honor a guest who happens to come during a distillation by inviting him to pour the guarapo into the caldron. Especially is this done if he has the reputation of having a "good hand." In such a case it is customary to bring the pots of guarapo to him. He receives them at the caldron and pours in the contents.

As before stated, the rum is usually caught from the spout in bottles, although it is almost immediately poured into a large storage vessel, usually a demijohn, of from five to ten gallons capacity. To use the large 27+ demijohn as a receptacle directly at the spout would endanger a large quantity of rum, for whenever a caldron boils over it is necessary to return the mixed rum and guarapo to the next caldron to be distilled.

When the boiling of a caldron first begins, the product is much purer than later in the process. No fixed length of time can be given for the distillation of a caldron, since the strength of the rum must be determined by testing each bottle as it is filled at the spout. The whole process, therefore, is one of fractional distillation, the strongest of the rum coming off in the first bottle taken from any given caldron. When at last the rum becomes sufficiently weak, it is considered that the distillation of that particular caldron has proceeded far enough and it must then be refilled with fresh guarapo.

Before refilling the caldron, the fire is first drawn from under it. A mouthful of water is then spurted in a small stream upon the now hard and dry plantain which cements the parts of the still together, thus softening it and permitting the parts of the still to be separated. The copper top is given a thorough cleaning and is scoured with ashes until bright, and the upper pot, or vaporizer, is also cleaned if necessary. The guarapo remaining in the caldron is dipped out with a long-handled dipper, and the caldron is finally refilled with fresh guarapo. If the result of the last distillation has been very successful, it is believed that the hand of the person who poured the guarapo into the caldron still holds its "luck," and he is usually expected to fill the

274 caldron a second time. If, however, a contrary result has been effected, someone else will usually "try his hand." [777] The whole process of rum-making is one in which the women do fully as much work as the men, and they also have "lucky" and "unlucky" hands in distillation.

Usually the ordinary distillation above described is considered sufficient. If, however, an exceptionally good rum is desired, as for use at certain feasts, a special process of fractionation is resorted to and the product of the ordinary distillation is redistilled. A special flavor is imparted to the rum at this time by putting into the caldron with it several of the large leaves of an aromatic herb which abounds in the region and which possesses an anise-like odor and flavor.

257 As previously stated, the chief use of sugar-cane is for making rum, but, as before described in speaking of foods, the Cayapa occasionally make syrup and also a kind of preserves. On the other hand, they never make 262 sugar, as do the negroes of this region. Much raw cane is also chewed. The fibrous though tender stalk is, of course, not swallowed, but it yields a large quantity of rich, sweet juice which is highly relished. The cane is also frequently roasted in the coals; and in boiling cane-juice to make guarapo for distillation, stalks of raw cane are frequently cut up and thrown into the kettle to boil with the juice. The result of either the roasting or the boiling is a rich food with a flavor resembling that of maple, and is even more palatable than the raw cane.

Cacao (Cayapa, kaka'bō), from which chocolate is made, is extensively grown by the Cayapa, although

almost exclusively for the sale of the dried seeds. The 245
planting of a grove of cacao requires considerable care. The seeds are planted in calabashes or boxes at the house, and the young plants are not set into the ground until they have attained a height of from four to six inches. They are carefully protected when first planted in the open ground, a joint of large bamboo being set down around each. This precaution is necessary chiefly on account of the prevalence of ants, which would soon devour the young plants if they were not thus protected. When encased in this tube of bamboo, although it is open at the top, the young plant is rarely molested. From four to five years are required to bring one of these trees into full bearing, but even with the crude Cayapa methods of horticulture, a large tree sometimes produces as much as two or three hundred pounds of dried cacao in a year.

The brown, ovate seeds, which are contained in a large 257
red or yellow egg-shape pod, are each surrounded by a whitish or translucent fleshy covering. The pods are gathered when ripe, brought to the house, and cut open with the machete. The seeds with their fleshy coating are then placed in a large wooden tray, such as that shown in pl. LXII, 4, some water is added, and the mass is kneaded and worked thoroughly with the hands, thus removing all the fleshy covering and leaving the seeds ready for drying. As a by-product of this process, the outer covering of the seeds, when mixed with water, forms 272
a liquid of the consistency of thin gruel and with a pleasant, slightly acid flavor. This liquid is very re-

[273] 257 freshing and is drunk with much relish by the Indians. The seeds themselves are spread upon mats on the drying platform of the house and are carefully watched during the next couple of weeks to prevent them from being wet by the frequent rains. After this period they are sufficiently dry to be stored away until the next trip down the river, when they are sold to traders. [438] Cacao is one of the most important exports of Ecuador, whose territory is the source of a considerable part of the chocolate of commerce.

271 272 Although the Cayapa cultivate so much cacao, they drink it only now and then, usually at fiestas. It is prepared by first thoroughly grinding the dried cacao upon a mealing stone such as is used for grinding plantain, and then boiling. For this purpose the Cayapa make a pot of special form, such as that shown in pl. LXXXVII, 9. The boiling chocolate is stirred at intervals with an implement of special form called tcädila'te tcali, illustrated in pl. LXI, 6-7. The result of this process is a comparatively thick, very rich and oily liquid, quite unlike the beverage prepared from the ordinary chocolate of commerce, since the chocolate prepared directly from the seeds as above described retains all the natural oil. It may be drunk in this form, but if sugar is available it is usually added.

249 [262] Pineapples (Cayapa, tci'lya), the only use of which is as a food, are grown to a limited extent by some of the Cayapa. The green tops of the fruits themselves are planted close together in rows, and from these the plants grow. When once established, such a plant requires

very little attention until time to gather the fruit, which 244
in this region is of excellent flavor, especially when allowed
to ripen thoroughly on the plant.

The fleshy roots of the yuca (Cayapa, hă'"tcă) are 244
considerably used as food. The yuca is started by 262
means of cuttings, and requires from seven to nine
months to produce the edible roots. These roots are [262]
usually boiled in the regular manner when used as an
ordinary food, but, as above mentioned, they are also
frequently boiled in sugar-cane syrup to make a kind of
preserves. The yuca is a very nutritious food, has an
excellent flavor, and by many is much preferred to
either potatoes or yams. It is never baked.

Potatoes (Cayapa, pă'lyă) do not thrive at this low 244
altitude, owing to the heat and humidity, although they 438
grow well in the valleys of the higher Andes. On 262
rare occasions they are obtained from the Indians of
these interior valleys who make journeys to the coast for
trading and other purposes. They have also been procured in more recent years from the traders about the
mouth of the river, but the Cayapa seldom purchase
commodities of this class.

Another food of a similar kind which is grown by the 244
Cayapa to a limited extent is the red yam. It is started 262
by cuttings in the ordinary manner. In preparing them 252
for food, the yams are boiled, but are never roasted, as
is so frequently done by aboriginal peoples.

Of this class also is the root-stalk of the rascadera
(Cayapa, tă'a), a species of caladium which is grown to a
limited extent by a few of the Cayapa. This is also pre-

[illegible] pared exclusively by boiling. Rascadera and yuca are grown to a much greater extent by the negroes who live along the river than by the Indians.

[illegible] According to their own tradition, the Cayapa, having been formerly a mountain people, in earlier times subsisted largely on maize or Indian corn (Cayapa, pí'cü), which is still one of the principal foods of practically all the Indians of the higher Andes. On moving to the lower altitudes, the Cayapa brought the maize with them, and even yet a small quantity is grown by them. The plant itself it comparatively small, and the ears are very small, rarely exceeding six or seven inches in length. 252 When gathered for food it is almost always taken green and is prepared in one of three ways. Frequently, the husk having been removed, the ear of green corn is simply roasted over coals, when it is considered quite a delicacy, though it lacks the rich flavor of our sweet corn. The products of the other two methods of preparing it are gruels. The first stages in making both kinds are the same, and the process is as follows: The necessary number of husked ears of green corn having been procured, the women chew the kernels from the cobs, depositing them in a large wooden tray, or batea. Since the introduction of various articles of commerce some households use a large tin grater for removing the kernels from the cobs. The kernels are then placed, handful after handful as needed, upon a mealing stone (pl. LXII, 1, 2) and ground with a stone muller such as the one shown resting on the mealing stone shown in fig. 2 of the plate mentioned, a small amount of water being added from

time to time. This thick paste is then placed in a 252
cooking-pot or kettle with the requisite amount of
water and boiled, the consistency of the gruel of course
depending upon the amount of water added. The
thick gruel is eaten with the fingers, or frequently nowadays
with a spoon, and is eaten as ordinary food. The [272]
thin gruel, which is more frequently made and which
usually is sufficiently liquid to be called a beverage
rather than a mush, is drunk from small hemispherical
calabashes. It is flavored with a little salt, or preferably [263]
with sugar. This food is called champo (tcambō'se in 415
Cayapa) and is used almost exclusively at feasts, where it 527
is served in canoe-shape wooden vessels, called tcambō's 272
kūle, made especially for the purpose. These utensils
are from two and a half to three and half feet long, their
ends are made like the prow and stern of a regular canoe,
and they are elaborately ornamented with the same
painted designs as are used on large canoes. These
little vessels may be set upon the feast table, but often
they are carried about among the feasters, in which
event one of the masters of ceremony takes the prow
and another the stern and pass throughout the house,
being careful that everyone is served. On the surface
of the beverage float from two to four or five small calabash
dippers, or mates, with which the champo is
drunk.

A sufficient amount of maize to provide seed for the 243
succeeding year is allowed to ripen on the stalk each
season. The ears are gathered, the outer husks bent
back, and tied together in bunches of a dozen or more

262 ears each. These bunches are then hung from the roof
to prevent attacks by rodents. Whenever possible the
corn is hung where the heat from the fire will keep it
from molding.

177 The foregoing are the chief agricultural food products
241 of the Cayapa. Excepting the maize and the potato,
242 all were introduced since the Spanish conquest and are
now systematically cultivated. In this connection
should be mentioned certain palms which provide food
of one kind or other, and which, while they cannot be
strictly classed under the head of agriculture, since
they are not planted and tended as are the other plants
mentioned, are of considerable economic importance.

222 One of these palms is that commonly known by the
Spanish name chonta dura and called kanö'tci by the
Cayapa. One variety of this produces a cluster of red
fruits, another a cluster of yellow fruits. The Cayapa
[262] name for the fruit of this palm is ka'imbi. Both ripen in
the late summer months and are much esteemed as food.
[413] By means of a long hooked bamboo pole, these clusters
are torn from just below the crown of the palm, which is
222 usually quite tall. The fruits are boiled in a cooking-pot
or kettle; the tough skin is then easily peeled off, leaving
the yellowish mealy meat ready to eat. In the center
of this, in turn, is a very hard nut which, when cracked,
yields a toothsome white meat with a flavor resembling
that of ripe coconut. The mealy yellow meat is
usually eaten with a little salt, but is especially good
when eaten with a thick syrup made from cane juice.
It is also frequently boiled in this syrup, the result being
a kind of conserved fruit.

While the fruit of the chonta dura is never eaten raw, 262
there is another palm that produces a fruit similar in [262]
form but of a grayish yellow color, which is considerably esteemed in its raw state. Neither of these species of palm is purposely planted by the Cayapa, but when found they are carefully protected, and the fruits are harvested year after year.

One other species of palm, a very tall, slender one, [262]
produces a fruit which is eaten raw. To secure this the [412]
palm is usually cut down with a machete, which is always carried by everyone going into the jungle.

One of the most important of the natural products of this part of Ecuador is the tagua, or ivory nut. These palms, called ti'ĕ tci or ti'mĕ bĕĕ, are scattered throughout the jungle and are carefully conserved by the Indians, especially where a grove of them is found near a dwelling. The importance of this palm applies both to the Indians and to the negroes and whites. The ripe [439]
nuts, timbĕ pü'ka, or *timb* pöka, are an article of commerce, and their exportation to the United States and to Europe, where they are extensively used in making buttons, is an important industry. To the Indians, however, the tagua serves at least three other uses. When its green burs approach maturity, they are gathered and taken to the house, where they are cut crosswise with a machete. These burs are covered by an outer shell, called ha'ñda kika. They are very hard and can be cut only with difficulty. Each of the nuts 262
in this stage of its development is an almost transparent gelatinous substance, called tcapi *ta'ka*, which may

262 either be scooped out with the fingers or sipped. The nut is not used as a regular article of food, but more as a confection, its use being much restricted by the supply and the difficulty of opening the bur.

262 Another food derived from the tagua is the yellow,
262 mealy and comparatively thin covering, called pim bikä, or ya ä'kä, which surrounds the ripe nut itself. This is peeled off and roasted over coals, if it is to be used immediately, or dried on the smoking rack above the fire if to be used later. The flavor of this roasted meat is similar to that of crisp, baked, fresh pork rind. It is also frequently eaten raw, but in this state it has a rather unpleasant flavor, similar to that of raw acorns.

[illegible] The gathering, curing, and use of the tagua leaf, which is almost exclusively employed in thatching houses, are described in the discussion of building construction.

222 A very good food is obtained from the palma real,
[262] called tya'-tcï. This is a very large species and in form is perhaps the most beautiful of all the palms. Its very straight trunk, which sometimes reaches a height of seventy-five to a hundred feet, swells considerably at a point about midway of its height and resembles an entasic column surmounted by a huge umbrella-shape crown of leaves which wave gently in the breeze. In a large specimen of this species the trunk is from three to four feet in diameter at its base, swelling uniformly to a diameter perhaps one-third greater at the middle, and again decreasing toward the crown to a diameter somewhat less than that of the base. The mature leaves reach a length as great as twenty feet.

The crisp, pure white, young leaves from the center 222
of the crown of this palm are much esteemed as a food [262]
by the Cayapa. To secure these, however, it is necessary to cut down the whole plant, which is done with a machete or preferably an ax. The large, mature leaves of the crown are cut and pried away until the inner part of the trunk is reached. These outer, old leaves of the crown are even more fibrous and resistant than the trunk itself, and as it is almost impossible to
cut them away with a machete, an ax is usually [42]
necessary. Owing to their great weight, and especially to the interlacing of the hard and very strong fibers at the bases of the leaves, a couple of chisel-pointed sticks, six feet or so in length, are needed to pry away the outer leaves after the mid-ribs have once been cut through with the ax. This inner trunk and those inner leaves which have already begun to unfold are next cut away, until the very young, succulent leaves, which as yet have not commenced to unfold and which appear in the form of a solid, slender cone of pure white, are reached. This cone often measures at its base as much as ten to fifteen inches in diameter, and may be even ten or twelve feet
in length. It is a solid mass of crisp white matter, finer 262
in texture than the innermost part of a head of cabbage and with a flavor resembling that of almonds. It is ordinarily eaten raw, either with or without salt, although a very good dish is also prepared by boiling it.

The palma real yields another useful product. The 222
tough fibers, called niitcú'a, which grow along the sides 283
of the base of the mid-rib of the mature leaf, and which, 782

222 as above mentioned, interlace with the fibers of adjoining
283 leaves in such manner as to make it necessary to pry the
482 leaves apart with wooden bars, are strong and pliable,
and are woven into burden-bands by which heavy loads
283 are carried. These fibers often attain a length of about
534 four feet and are possessed of tensile strength sufficient
177 to enable their use as strings on the wooden harp which
is now made to a very limited extent by the Cayapa.
This instrument was borrowed by them from the Indians
of the interior, who in turn copied it from the Spanish
conquerors.

222 Another palm, found to a limited extent along the
river, is the coconut, called after the Spanish, kō'kō-tci. It does not, however, thrive at any considerable
distance from the ocean, consequently few palms are
found even at so short a distance up the Rio Cayapas
as the mouth of the Onzole. Pl. CXXXI presents a view
looking up-stream at the confluence of the Rio Onzole
with the Rio Cayapas, and, upon the projection of land
between them, the hacienda of one of the more prosperous
of the negroes of the region. Several coconut palms
[439] appear in front of the house. Coconuts grow well
along the immediate coast, and there are here large
groves, the nuts being shipped to nearby villages and to
points even as far away as Esmeraldas. They are purchased to a certain extent by the Indians, by whom they
are used in very limited quantities as food, more especially for the so-called coconut-milk which is made from
the ripe nuts.

In addition to the foregoing food-producing plants,

addition to the foregoing food-producing plants 248
there are various others that are valuable for other materials which they produce. One of these is cotton, called *hä'a*. The Cayapa are expert weavers and in 246
large measure produce all their own material. Their
textiles are made almost entirely of cotton, the only wool [439]
used being that obtained from the Quichua of the higher Andes, or in these days from the yarn of commerce. The yarn used by the Cayapa is always red or blue, and is employed for the sake of the colors, not for the material itself. They grow a white and also a brown cotton, the 248
former being, according to their statements, an introduced species, the latter an indigenous one. These, [316]
together with the green and lavender dyes and the two colors of yarn, give them a total of six native colors. Cotton is usually grown from the seed, and requires little attention when once the plants have attained a fair size. Only a few plants of either the white or the brown cotton are grown by any one family, but they bloom perpetually and are sufficient to produce all the raw material needed. The cotton is allowed to mature completely, that is until the bolls have opened and the ripe cotton is nearly ready to fall. It is then gathered (being in the condition shown in pl. CVII, 11), thoroughly dried, and stored away in packages (such as that shown in fig. 12 of the same plate), and wrapped in leaves of the hoja blanca,
until needed for spinning. To a limited extent also the [272]
cotton plant is used in making a beverage, the leaves being boiled after the manner of tea.

Tobacco is considerably used by the Cayapa, but never 276

[430] [177] to excess as among some other peoples. It is almost never grown by them, their supply coming from their negro neighbors or through trade. The Indians claim that tobacco was not known to this region in aboriginal times, but that it was introduced considerably later than the Spanish conquest. This statement is borne out by the fact that the name for tobacco is ta′kō, which is evidently an adaptation of the Spanish term tabaco. They use neither pipes nor cigarettes, but confine their smoking entirely to cigars made by themselves. They procure the half leaves of tobacco in bundles, which are stored away until a smoke is actually wanted, when each person rolls his own cigar. The habit of chewing tobacco appears to be unknown.

276 776 789 In addition to smoking for pleasure, tobacco is used ceremonially. When it is desired to drive out malevolent spirits from a certain spot, a medicine-man is called in, and, assisted by the ordinary people present and perhaps by another medicine-man or two, he performs a ceremony which makes the place untenable for the spirits. Each participant provides himself with a cigar and a small calabash of a decoction made from the leaves of a certain herb, and all make a systematic tour of the infested place. As they go slowly along they wet everything about them with the decoction, blowing it from the mouth in a fine spray. Interspersed with this spraying is the blowing of tobacco smoke into the air and on any objects with which they come in contact. The head medicine-man sings or whistles certain songs and waves a special banner from time to time as the party proceeds, and

these acts, combined with the spraying and smoking, 77
gradually drive the spirits from the locality. 78

Another important product of this region is pita, called 245
sa'nō, by the Cayapa, a plant resembling somewhat the yucca of the Southwestern desert region of the United States, but with leaves which sometimes reach a length of fifteen or sixteen feet. It is usually grown at some distance back from the river, and seems to thrive best in the dense shade of the jungle. When once well started it requires very little attention other than the cutting away of undergrowth and clearing of the field which is incidental to the harvesting of the leaves. These [283]
leaves yield long, very strong fibers, called sañ bu'tyū, which are twisted into two-ply strings. These are much used in net-making, in binding the selvage of textiles, for fish-lines, and for a variety of other purposes where very strong cord is required. The leaves are cut close to the ground and brought to the house in bundles such as those illustrated in pl. LXVI, where a large and a small bundle of the freshly cut, long leaves are shown leaning against the side of the house. Each leaf yields a large number of fibers, the laborious preparation of which will be discussed in speaking of string-making.

While pita is the strongest material and is considered 222
the best from all points of view, there is another material, 283
called in the local Spanish cosadera and in Cayapa señgi'lya, which is used especially where string or rope of large diameter and of moderate strength is desired, such as for hammocks. This material is derived from the bark of a tree and is obtained by heating in a manner

222 283 similar to that used in making the bark cloth of the region. When the fibers are beaten out and prepared for twisting into cordage, they are usually stored away in bundles, such as that shown in pl. CXIX, 2, until needed.

222 287 An important economic plant of the Cayapa country is that from which is made the bark cloth called by the local Spanish name damajaua and by the Cayapa name tû'ckī. This is beaten from the bark of an indigenous tree called tû'ckītcī. The tree is felled and a section of the bark the length desired, usually six to eight feet, is carefully removed, being split along one side 287 only. The bark may then be beaten immediately upon the same log, but it is ordinarily rolled up and taken to the house where a log is kept especially for this beating, which is done with a short maul, called tatcī wīma'so, such as that shown in fig. 6. One side of the maul, at least, is cut diagonally with grooves and corresponding ridges. The beating must be done within a few hours after the bark is taken from the tree, or before it dries considerably. Placing the strip of bark crosswise upon the log, it is beaten with considerable force with the grooved side of the maul, which is held at an angle of about forty-five degrees to the length of the bark. After beating one short section of the bark in this manner, it is moved across the log far enough to bring a new section into place, and in this way every part of the bark is reached.

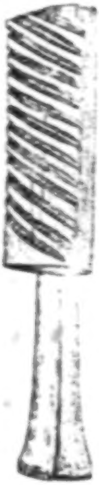

FIG. 6 — Beater for bark cloth

Having beaten the entire surface with the bark in this position, it is then reversed and placed lengthwise of the log and again beaten, the maul being held at about the same angle. This beating crushes into pulp the succulent portion of the bark, but, if properly done, it does not break the long, interlacing fibers themselves. As a result of this first beating the bark is usually about one-half wider than when taken from the tree, though it is very little if any longer. It is next placed in a canoe half filled with water and allowed to soak for several hours, usually over night. It is then thoroughly wrung, thus removing a large part of the juice and the pulpy portion of the bark, after which it is returned to the log and beaten again in order to remove the remaining pulp. Again it is thoroughly washed and wrung, and is finally spread out to dry. Just before being dried it is folded in the proper manner and creased along the lines of the folds in such a way that when dry it will readily fold along these lines and make a package with a surface about ten by eighteen or twenty inches. Pl. cvi, 3, shows one of these bark cloths partly unfolded. This is a large specimen and is folded three times lengthwise and three times crosswise. The four crosswise sections formed by the three folds are here visible. The full width of the cloth is thus seen, while only one-fourth of the length is shown. Bark cloth is usually from six to eight feet in length and varies in width from about four feet to perhaps eighteen inches, according to whether it is to be used by one or more persons at a time. The surface of the specimen illustrated plainly shows the

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SD6 Cayapa SD6

287 imprint of the maul (fig. 6) with which it was beaten as numerous sets of short parallel lines, all at an angle of about forty-five degrees with the perpendicular. Bark cloth is never decorated in any way and is strictly utilitarian. It serves almost exclusively as a sleeping [352 513] mat, and constitutes, together with a mosquito canopy and a thin cotton sheet used as a cover, all that is considered necessary for a bed. It is used occasionally for wrapping a dismantled loom or for some other special purpose.

The beating of the cloth must be done very carefully in order not to cut or tear apart the fibers, thus making holes in the cloth which render it practically worthless. The fibers naturally criss-cross and interlace in such a manner that when the beating is carefully done the result is a cloth which, while very thin, is at the same time very firm. If for any reason, however, a hole does appear in the cloth during the process of beating, it may be mended by simply placing over it a piece of bark of sufficient size to somewhat more than cover it and beating this in. The beating mixes the fibers of the patch with those of the main fabric in such manner as to make the patch almost as firm as the cloth itself.

415 249 177 At the present time some of the most characteristic utensils of the Cayapa are made from calabashes. They claim that in their former life in the mountains these utensils were of pottery and that the calabash came into use among them only after their arrival on the Rio Cayapas. It is said also that there was originally a calabash tree native to this region, but that the two

species now used, the one producing a globular fruit 415
called wa'iyū, and the other an ellipsoidal fruit called 24
cū'lya, were introduced here from Colombia. Every [illegible]
house is provided with one or more of these trees, and
usually at least one of each of the two species. These
large gourd-like fruits are produced in considerable numbers
by such a tree and find a variety of uses. They
are gathered when just ready to turn from green to ripe
and are immediately hollowed out into utensils of several
kinds. The details of manufacture and the uses of
these utensils are treated on pages 166–173.

Another fruit, some species of which are said to be 222
indigenous and some introduced, which is found abundantly
in this region, is what is called by the local Spanish
name guabo or guaba. This requires no cultivation, but
the trees are carefully guarded against destruction. It is
rarely if ever purposely planted, but grows from the [241]
accidental dropping of seeds. In the vicinity of almost
every house there are several trees of one or more of
these species. The fruits, which grow in long pods, are [262]
much esteemed and are almost invariably eaten raw.
Each variety has its own special name, as follows:

| *Cayapa* | *Spanish* |
|---|---|
| mactē'-pa cīlyū, | guabo de macheton (machete guabo, so named on account of the shape of the pod). 824 |
| ni'ñga cīlyū, | guabo de tacoano. |
| pī' cīlyū, | guabo dulce (sweet guabo). The Cayapa name signifies "water guabo." |
| sa' cīlyū, | guabo agria (sour guabo). The Cayapa name also signifies "sour guabo." |
| pū' cīlyū, | guabo. |

Of these species the one most commonly found about the houses and the most used is pū′ cīlyū, a wide-spreading tree reaching a height of about forty feet. A general view of this species is shown in pl. v, in which the broad, branching top of one of the trees is shown prominently against the sky toward the left of the center of the picture. The habits of growth of the other varieties are similar to this.

247
301
[527] A species of small Compositæ, called l*u*′lyū, which somewhat resembles the marigold, is grown with considerable care, its special use being to provide decorative flowers for fiestas. The flowers are made up into long garlands which are draped about the altar of the church or are worn about the necks of those celebrating the fiesta. They are also sometimes inserted in the hair, over the ears, or about the clothing.

249 Upon the drying platform attached to the house there is almost always a fragment of an old canoe or some broken pots or other utensils in which are grown several of the various species of medicinal herbs, such as limoncillo, or of other plants valued for the scent of their leaves or seeds, or plants used as teas.

In addition to those already mentioned in greater detail, there are several other introduced fruits, such as the papaya, the caimito, the orange, the lemon, the lime, and the sour sap, which are grown so rarely by the Cayapa as to make them almost negligible in a consideration of the vegetal products of the people. They spring up almost always by the accidental falling of seeds in favorable soil, rather than by intentional planting. They are, however, all eaten raw and to a limited extent by the Cayapa whenever obtainable. 246 262

## HUNTING

In the Cayapa region, where game of various sorts is so abundant, hunting is a practice of considerable importance. This is now done almost entirely with old-fashioned muzzle-loading shotguns, which have supplanted blow-guns almost entirely. In aboriginal times the blow-gun was the chief weapon employed in hunting, and a few of them are still in use, especially by the boys in hunting small birds. In addition to the blow-gun the Cayapa say that they formerly had lances made entirely of the wood of certain hard palms, and that more recently they used the bow and arrow. They maintain that they originally did not know the use of the bow and arrow, but that they became acquainted with these only after coming down from the high mountains to the vicinity of their present abode, which was then occupied by another people. The bow and arrow appear to have been comparatively little used at any time by the Cayapa, but formerly the lance was much used in hunting wild hogs and one or two other species of game. In fact it is still used by some in hunting the guanta, a species of large rodent which lives in burrows. 224 411 [177] [177]

The blow-gun, called by the Cayapa pitcü'ə, is a slender tube varying from about six to nine feet in length, made of palm-wood wrapped with pitigua and the whole covered with brea, the black waterproof wax used especially for calking canoes. The blow-gun tapers [237] slightly toward its point, the opposite end being provided with a flaring mouth-piece two to three inches in diameter. It is made a follows: The innermost part consists of two pieces of palm-wood, each containing a groove, and forming, when placed together, a perfectly even-bored tube about three-eighths of an inch in diameter and with a wall half to three-quarters of an inch thick. The two halves of this tube are bound firmly together at from three to five points along its length by means of thin, narrow strips of pitigua, or with one of the stout fibers from the base of the leaf of the palma real. This binding is merely to hold the two halves of the tube together while they are being completely wrapped, which is done with strips of pitigua about one-sixteenth of an inch in thickness and one-quarter of an inch in width. It is wrapped tightly and very evenly from end to end in such manner as to completely cover the wood. This spiral wrapping of so long an object [384] requires a great length of these narrow strips. As the end of one strip is reached, the end of the next is inserted in such a manner as to be held firmly in place and to make each strip bind the next. This pitigua wrapping is in turn covered and made waterproof by a coating of brea, or wax, as above mentioned. On some of the blowguns a hump is made in the brea at a point a short distance in front of the mouth-piece. This serves as a kind of sight by which to take aim, though obviously it is not a very accurate gauge, consequently the aiming is largely a matter of calculation by the hunter, and accuracy is acquired only by long practice. The

3: Barrett E-5 (1908-1909) 1925

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mouth-piece of the blow-gun is made of a more or less funnel-shape piece of wood which fits to the larger end of the gun. The implement is shot by blowing the breath suddenly, though not too forcibly, through this mouth-piece.

In this tube are shot very light palm-wood darts, called mō'te or hambĭ tsû'ta, a foot or so in length and not much thicker than a heavy knitting-needle. Their lightness is overcome and the darts are given force by means of a weight of clay, called ya'tû'mita, placed near the point. To make them fit in the tube in such a manner as to be air-tight, and thus give the air an opportunity to exert its force upon them, a small wad of cotton, called kûmĭ tē'na, is wound about the dart near its middle. One of these darts is shown in fig. 7, a. Near the point may be seen the pear-shape clay weight, and about its middle the cotton wad. Such a small shaft would be of little service even

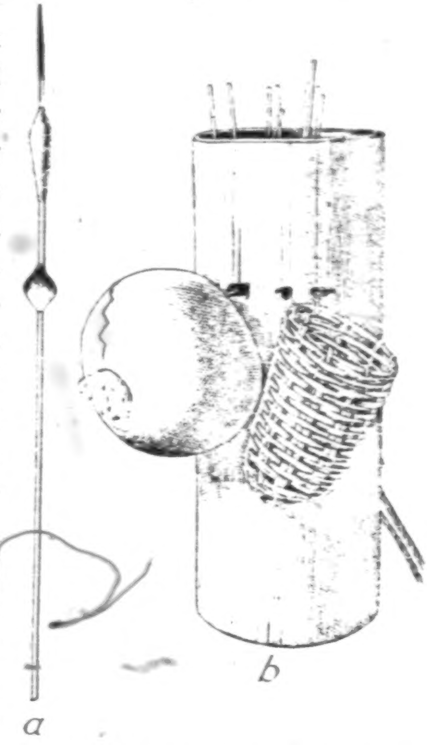

FIG. 7.—a, Dart of blow-gun; b, Quiver for blow-gun

224 in killing small birds if it were not for the fact that
41 its tip is poisoned. The tip is sharply pointed and
278 is covered for perhaps three-quarters of an inch back
224 from its point with a vegetal poison called ha'mbī,
411 consisting of the juice of a large tree growing in only a few places in the vicinity. This sap is gathered after the manner of rubber milk or the sande juice used in making torches. It is very viscous, and runs very slowly from a cut in the tree; in fact it is claimed that a few ounces only may be obtained from a tree in the course of a day. The juice dries within a few days, becoming solid and black or dark-brown in color. To get this into such a consistency that it may be applied to the points of the darts, a few drops of lemon or lime juice are added on one side of the receptacle in which it is kept, and a small amount of the poison worked up with this juice into a paste by means of a small paddle. The points are then dipped into this and revolved in order that they may be completely covered with it. They are then carefully laid out with a low support just back of the point so as to keep the poison from touching anything, and sufficiently low to prevent the paste from flowing back from the tip to any extent. The paste dries evenly around the point in about an hour and finally becomes very hard. When in this condition it will not rub off with ordinary friction, but immediately it comes into contact with liquid it dissolves. Thus, when a dart enters the body of a bird, a small mammal, or even a man, the poison quickly passes into the circulation. It is said to be very virulent poison and that

[illegible] dart.--Analyst

death ensues within a few minutes, even in men or large 278 mammals. The palm-wood from which the darts are 224 made is very tough and ordinarily would break with 411 difficulty, hence one of them shot into the body of an animal, especially a man or a monkey, could be easily withdrawn. To overcome this, two slight incisions are made around the shaft, just back of the poisoned tip, about a quarter of an inch apart, so that if the shaft enters a body it is almost certain to break with the force of the blow at one or the other of these incisions. In case the dart does not break of its own accord, it is quite sure to break if an attempt is made to extract it, and in either event the poisoned tip is left in the flesh of the victim. Great care must be exercised in making and in handling these darts in order that the owner himself does not get even a small amount of the poison into his system through an abrasion of the skin or by pricking himself with one of the sharp points, for it is claimed that such an accident would almost surely prove fatal. However, without thorough experimentation with this poison it is impossible to vouch for the extreme virulence attributed to it by the Cayapa. There seems, in fact, some reason to doubt its very rapid action on the larger mammals, though in the case of small mammals and birds it is undoubtedly very effective.

A small carrying case, or quiver, called ha'mbi pa''ki, such as that shown in fig. 7, *b*, is made especially for blow-gun darts. It consists of a bamboo tube, about an inch longer than the darts, which is filled with soft fibers from the young leaves of a certain species of palm,

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the fibers being placed vertically in the tube. This filler is called hambi yata'pi. The palm fibers protect the points of the darts and also prevent abrasion of the clay weights. The rear or unpoisoned ends of the darts project an inch or so above the filling, the projecting end serving as an easy means of extracting the darts as needed. In the abovementioned illustration the ends of some of the darts are shown projecting above the rim of the quiver. In actual use the ends of the darts are usually below the level of this rim and are thus afforded all possible protection. In making the drawing for this illustration it seemed desirable to show the ends of some of the darts, hence they were pulled up into view above the rim.

The usual method is to poison the points and make the incisions above mentioned directly back of the points, and then to place these incomplete darts in a mass in the center of the quiver. Attached to the quiver is a small receptacle, called *tö*'kūbi, usually a little wickerwork basket, in which clay is carried. Also there is attached to the quiver a small calabash or other receptacle for cotton, called hambī kō-a'iū. These appurtenances enable the hunter to put the clay weight and the wad on the darts as fast as needed. This is necessary, since if they were prepared in any considerable numbers and not used, the clay and the cotton would be of no service later. Usually three or four darts at a time are weighted and wadded ready for use and then carefully placed, each one by itself, near the outer margin of the palm-fiber filler. The quiver is suspended upon the hunter's back by

means of a string, called yå"tcua, which passes about 224
the neck. 411

The blow-gun is carried over the shoulder or in the hand, but always with the point forward, since if it were reversed there would be danger of the mouth-piece being broken in passing through the jungle. When not in use the blow-gun is carefully keep in such position that no uneven strain comes upon any part of it, causing it to bend and thus to spoil its efficiency. It is frequently placed in the thatch under the eaves or in the loft of the house, but often it is suspended vertically by means of a string.

The blow-gun is an excellent and effective weapon for hunting all sorts of mammals and birds which live in trees or otherwise above the ground level, but for those which live always upon the ground and for birds on the wing this instrument is of little use, since it is not feasible to shoot horizontally or, in fact, at any considerable angle to the perpendicular, owing to the deflection due to gravity. Especially is this the case if the object shot at is small. The best results are obtained by getting almost directly under the object to be shot at and by this means practically overcoming the influence of gravity. Thus the blow-gun is especially used in shooting those mammals and birds, such as monkeys, squirrels, guatins, parrots, toucans, and a variety of other species, which are almost always to be found in trees.

The Cayapa were at all times inclined to be peaceable, 726
but wars were sometimes forced upon the most peace- 721

loving. It is said that on those rare occasions when the
Cayapa engaged in hostilities, the blow-gun was used as
a weapon, though the lance, called tsū'ta, seems to have
been preferred. This weapon, six or seven feet in
length, is made entirely of palm-wood, with a simple,
411 very sharp point. A rude lance is used even at the
224 present time in hunting certain mammals, especially
the guanta (Cayapa wala'mbū), a large rodent which
lives in a burrow. Armed with a lance, the hunter sits
near the entrance to one of these burrows until the guanta
comes out to feed, when he is able to spear it. On rare
occasions also the lance is still used in hunting the wild
hog and the peccary, which are both still fairly abundant
in the jungle.

The bow and arrow, the use of which is claimed to have been derived by the Cayapa from their old enemies, the former inhabitants of the Río Cayapas, is not very clearly remembered by them, for the reason that it has not been in use for many years. The arrows are said to have been about a yard in length with shafts made from a species of wild cane, called by the Spanish name caña brava and by the Cayapa nya'nyi. The points were made of hard palm-wood. The bow and arrow appear, however, to have been comparatively little used by them at any time, and almost never as an implement for hunting. No names other than the Spanish terms for these two weapons could be learned.

No nets or snares are used by the Cayapa in the capture of mammals or birds, and only one form of trap is employed. This is the small deadfall shown in fig. 8, used for catching small mammals, such as woodrats, which abound in almost all parts of the jungle, and especially in places which have been recently cleared or about the edges of an old clearing. In large measure the [857] boys build and tend these deadfalls, one or two boys sometimes having as many as half a dozen of them. They are constructed as follows: Two rows of upright sticks of almost any material are set just far enough

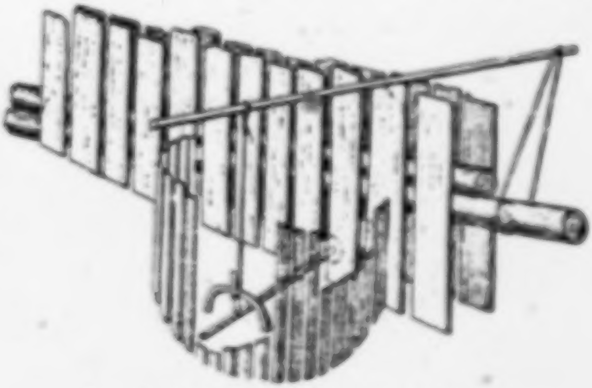

FIG. 8.—Deadfall trap for small mammals

apart to permit the free rise and fall of a log or a heavy section of the stem of a plantain or banana palm. These two rows of sticks form what may be termed the fences of the trap. To one end of this log, which is usually from four to six feet in length, is attached a cord or a piece of pitigua, which in turn is fastened to one end of the stick used as a lever. One of the upright sticks in one of the fences above mentioned is so notched as to receive this lever, which passes diagonally across it and out so that its other end is opposite a point about one-

224 third of the way down the log and perhaps a foot to one side of the fence. Another string or piece of pitigua is attached to this outer end of the lever and passed down to a small trigger by which the trap is sprung. The drawing for the illustration here given was so made as to show the manner in which the trigger and the bait-arm are set. This was done by cutting away in the drawing a part of the semicircular fence erected at the side of the trap to protect the trigger apparatus from being set off by some animal prowling about outside. A twig is set into the ground in a semicircular arch directly below the lever arm above mentioned. Through this arch passes the outer end of the bait-arm, the inner end of which extends through the fence which runs along the side of the log. This inner end bears, directly under the log, a piece of plantain or other bait. To hold this bait in its proper position, which is an inch or two from the ground, the outer end of the bait-arm is stuck into the ground very lightly. Its position must be firm enough to hold it sufficiently so that the pressure of the trigger upon it will not force it out of place and spring the trap; but it must not be too firm, lest the nibbling of the game at the bait will not move it sufficiently to release the trigger. The trigger is set vertically under the arch, and with its lower end resting upon this bait-arm, as is shown in the illustration, in such a manner that a very slight movement of the latter will release the trigger, which, operating through the lever, allows the log of the deadfall to drop upon the game. Often two or three rats are caught at one time with this device, which is

made more effective, in case the single log above mentioned is not sufficiently heavy, by superimposing upon it another which not only adds weight and enables the trap to kill larger animals, but accelerates its action and diminishes the possibility of the game escaping after the trap is sprung but before the log can fall. Such a second log is usually a foot or so shorter than the other. 224

## FISHING

226 The numerous streams of the Cayapa region are well stocked with various kinds of fish, many of which are used as food by the Indians. They are at present caught by six different methods. There are three types of nets, the "re," or large set-net, the atarraya or conical casting-net, and the small dip-net, used incidentally in connection with the set-net. These are all used to a considerable extent, especially the set-net; but the "corral," or impounding trap, the pole and line, and the "gig," or fish-spear, are much more generally used. Of these six devices, four only, the set-net, the dip-net, the corral, and the gig, appear to be of aboriginal origin. 227 286 [177]

The re, called in Cayapa wa'kä, is, like the other two nets used by the Cayapa, made of pita fiber string and is used especially in catching a very excellent species of shad (Spanish, sabalo), called by the Cayapa awī'li. For this purpose it is made with a mesh of about three inches, and varies in length from about twenty to sixty feet according to the width of the particular estero in which it is to be used. Usually near a house there are one or more esteros where shad are fairly abundant, 226 286 226

226 but they cannot be taken at all times. When the river is in flood, the shad go in large numbers up the esteros in search of certain vegetal foods which are made available by the rise of the water, and it is customary to set a net across the mouth of an estero at about the time the flood commences to recede. As the water level
226 lowers, the fish endeavor to return to the main stream,
227 but are impounded near the mouth of the estero by the net, which is securely fastened at both ends and is weighted down with stone sinkers called cü'pŭka or cä'pŭka (literally stone), along the bottom, these being wrapped in the tough leaf called ä'tya haki to prevent them from wearing the cords by which they are tied to the edge of the net. These sinkers are usually water-washed pebbles ellipsoidal in form and weighing not more than a few ounces each. The sinkers are trampled into the mud in order that no openings are left through which the fish may escape into the main stream. The upper edge of the net is kept up to the surface of the water by means of floats, called walä de''pŭka, consisting of variously shaped blocks of balsa, a species of very light wood, and is supported also by one or more vertical poles stuck securely into the mud at the bottom of the estero and to which the upper edge of the net is tied. This last precaution is necessary because with the recession of the water there comes a considerable amount of small drift-wood and leaves which would gather about the floats of the net and finally sink its upper edge, at least in places, thus allowing the fish to escape.

225 When the water has sufficiently subsided so that the

fish have nearly all returned to the mouth of the estero, the owner of the net, accompanied by all available members of his family and by any friends present, goes to the estero with a second net of the same kind. This net is carried up-stream to a point where the water is very shallow; it is then placed across the stream and moved carefully down as a seine, the fish being driven before it. In this way the fish are at last impounded between the two nets in a space from twenty to twenty-five feet long and of the width of the estero. Ordinarily, in bringing the net down to this point, a considerable number of fish are caught by hand, for while two or three persons attend particularly to the moving of the net, others are diving in the water ahead of it and catching by hand any fish which may have sought refuge in hollow logs or in crevices in the banks. Also many are caught as they strike the seine in an attempt to run back up-stream. Such a fish will usually push several times in succession at about the same point in the net, thus giving to one of the fishermen ample indication of its whereabouts. As each fish is brought up by a diver or is caught by one of those tending the seine, the top of its head or the back of its neck is bitten, thus stunning it, and it is either thrown into a canoe kept at hand for the purpose, or cast upon the bank. When the nets are finally brought close together so that the remaining fish are impounded in the small space above mentioned, conical dip-nets are used by the divers to catch them. As the dip-nets are brought up, they are passed to a man in the canoe, who empties them of the

226 fish and kills with a club the larger ones which might
[227] flop over the gunwale. Finally, all the fish possible having been taken in this manner, the set-net and the seine are taken up and brought back to the house.
227 Both are carefully washed and cleaned at the river after having the stone sinkers removed, and are then hung up on a long bamboo pole, especially provided for this purpose, over the drying platform at the side of the house. When thoroughly dried these nets are each carefully folded and then compactly twisted, in such fashion as is shown in pl. cxx, 2. The stone sinkers are unwrapped and stored away in a basket until again needed. The floats used on the net here shown measure about four by eight inches by three-quarters of an inch. In many other cases the floats are of various other forms. They are quite often cylindrical.

226 Nets called atci̦ wa'kū, of the same kind but with
286 smaller meshes, are made for catching certain other species of fish. In general, however, the use of the seine is confined largely to catching shad, as above described.

226 The atarraya, which name is corrupted by the Cayapa
227 into a*t*a'ia̦, is a large conical casting net heavily weighted
286 about its mouth with lead or, when this is not available, with stone sinkers. In pl. cxx, 1, is shown one of these nets weighted with lead sinkers weighing in the aggregate about twenty-five pounds. In this illustration it is shown folded at about its middle, while the upper end or apex of the cone is wrapped around the remainder
22 of the net. To the point of the cone is attached a long, heavy cord, the end of which is held in the hand when

226

the net is thrown. To cast this net well requires much practice. It is always done by a man standing in the prow of a canoe propelled by a paddler at the stern. He watches the water and throws the net at any point where the fish appear to be moving or jumping. In making such a cast, the line and the upper part of the net are coiled in the left hand, while one edge of the sinker-lined opening is caught between the teeth. The greater part of the weight of the sinkers is swung by the right hand until a sufficient motion has been secured to give force to the cast. Then the coiled net and cord are liberated by the left hand at the same moment that the right hand throws the heavy weight of sinkers. The edge of the weighted opening is held between the teeth an instant after the cast is made, thus causing the net to open in a wide circle as it descends through the air. The heavy weights sink the entire net very rapidly in the water, thus imprisoning any fish which are within the circumference described by the sinkers and the edge of the net. The net is allowed to sink to the bottom and is then pulled in: this must be done very carefully and in such manner as not to raise the sinkers from the bottom of the stream too suddenly. They must be dragged along until they have all come together in one point, and the fish, if any have been imprisoned, have been driven into the upper part of the net. The net is then carefully pulled up beside the canoe, the sinkers meanwhile holding the opening sufficiently well closed to prevent the escape of the catch. By simply pulling on one side of the net, the

226 fish are allowed to fall into the bottom of the canoe or into a basket, and the net is then ready for a second cast. This net serves only for taking small fish, and is not very much used by the Cayapa. Apparently their [177] knowledge concerning this form of net was acquired from the negroes. At any rate their knowledge of its use is comparatively recent.

226 227 286 The dip-net, called by the Cayapa cī'a, above referred to, is a small-meshed conical net and is used not only for fishing, as above described, but especially is it employed for catching the small lobster, or crayfish, called by the Cayapa pī'cū or a'bīcū, which is so abundant along the banks of the river and especially along the banks of the esteros tributary to the river. The opening of this dip-net is held in shape by a hoop made of a pliable vine simply bent around and its two ends tied firmly together. Thus one end of the hoop is rounding and the opposite end, the one used as a handle, is fairly sharp-pointed. The dimensions of this opening are perhaps fifteen to twenty inches by thirty to thirty-six inches, and the distance from the rim to the point of the cone of the net itself is from twenty-four to thirty inches.

All nets are made from pita-fiber string, the details of the making of which, as also of net-weaving, are treated in the discussion of cordage and netting.

22( A corral, or impounding trap, such as that shown in pl. LXVII, is used by almost everyone living along the tidewater portion of this river system; and, owing to the level character of this coastal plain, the tidal rise

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IMPOUNDING TRAP FOR SHAD

[p. 126 (A)]

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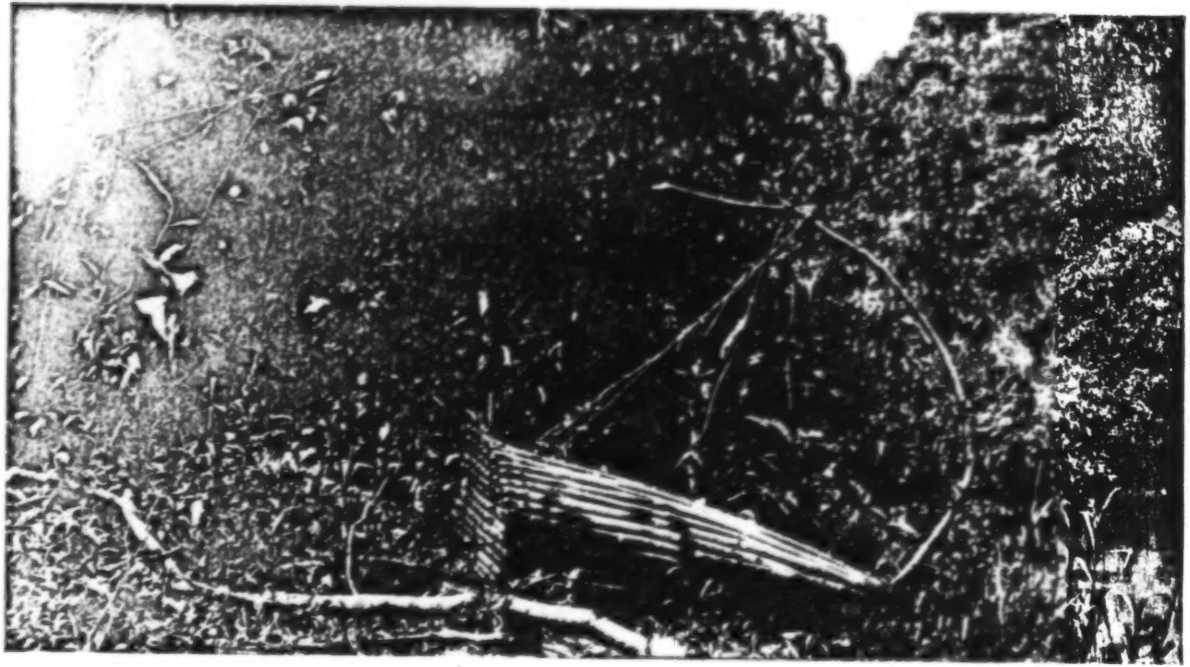
[p.126(B)]



NEAR VIEW OF SPRING TRAP

and fall are felt many miles from the river mouth. The success of this form of trap depends particularly on the peculiar habits of the shad. As above stated, this fish subsists entirely on vegetal foods, which it hunts along the river banks at high tide and usually at night, keeping at other times in the deeper midstream waters. At times of flood, as mentioned in speaking of the use of the set-net, the shad abandon the main stream and visit the esteros. Obviously, therefore, the corral is a device suited especially to those parts of the river where the water level rises and falls with the ocean tide, and obviously also it is of no service when the river is in flood.

A point properly protected from strong currents at times of flood, and otherwise suitably situated along the river-bank, is selected, and a pole, to which some plantains or other vegetal foods are attached, is placed in the water near the bank in order to give assurance that the point selected is one specially frequented by shad. The shad come almost exclusively at night, and if it is found that the bait has been taken on several successive nights, it is selected as the site for a corral. Care must be used in selecting such a site, for if it be chosen along a part of the river-bank where the current is rapid, the corral is likely to be carried away during a freshet. A desirable site having been found, two sides are built by setting firmly in the mud bamboo or palm-wood sticks, these being bound firmly together by means of cross-bars running horizontally and braced by others extending diagonally. These two sides proper are

226 usually much wider than the third side, or that which faces the river, and which may be termed the end of the corral. The opposite sides are not parallel, but converge as they leave the bank. The fourth side of the trap is formed by the river-bank. The three sides which project into the water are of sufficient height that they emerge from four to six feet above the surface at high tide. The front side or end of the corral is often very little wider than the gate situated at its bottom. This opening varies in size according to the dimensions of the corral, but it is always at least three feet wide and equally high. Two smooth, straight poles are placed vertically just inside this front wall, and upon these the gate, which is usually made of palm-wood poles bound by pitigua to cross-bars, slides up and down. The gate is always weighted with heavy stones, which cause it to drop quickly, and it is held up and open by a pitigua cord that passes over a rounded transverse bar overhead and then back to a blind on the bank from which the trap is sprung. At a point just outside the gate there is usually placed a vertical pole to which is attached a small amount of bait which serves to entice the fish to the gate itself, through which they later enter the trap where they espy more bait fastened to two or more vertical poles at some distance in from the gate. These poles, being quite slender, shake easily as the fish nibble at the bait, and it is the motion of the upper end of the pole that gives warning of the presence of the fish to the watcher on the bank. The corral is usually watched only at comparatively high tide, for

it is then that the shad travel near the bank in search of food. Furthermore, the opening of the trap is ordinarily somewhat above water at low tide, as is shown in the illustration above mentioned, the photograph for which was taken at very low tide and when the whole corral was entirely above the water line. The greatest of care must be exercised in watching one of these corrals, since the fish are easily alarmed and any noise or unusual movement about the corral is likely to frighten them away. Frequently, in order to render the surroundings more realistic and natural, some palm-leaves or some branches of trees are placed in or along the bank about a corral. The trap being sprung, the fish are impounded until the tide ebbs, when they are left in very shallow water, or even in the mud itself, and may be easily taken from the corral. The catch in one of these corrals is, of course, very uncertain, but frequently several fish are taken at one time, and while shad are especially sought, various other fish are impounded as well. 226

Fish-spears or gigs are of two kinds. That at present in use for large fish is of the ordinary trident form, called a′sta in Cayapa, and is strictly an introduction of civilization. Its head nowadays is made by blacksmiths at the coast. The pole on which this head fits is from ten to fifteen feet in length. One end of the pole is split and the flat tang of the spearhead is inserted, the joint being securely wrapped with pita string, which is water-proofed and protected by means of beeswax. As an additional precaution against loss, 227 [177]

227 several stout strands of pita cord are fastened securely to the head at the point where the prongs branch off from the tang. and these are attached to the pole at a point a few inches up from the head. Thus in case the head should pull out of its socket it is still securely fastened to the pole and cannot be lost.

The other form of fish-spear, called in Cayapa pūtyū'lya, is made usually with a long, slender, palm-wood pole not more than half an inch in diameter, the prongs being made from heavy fish-hooks which have been straightened out. The point of the pole is fairly flat and about an inch in width. From two to four straightened fish-hooks are bound to this flat point by means of pita cord, which is then thoroughly covered with brea to make it impervious. This form of gig is
226 suitable only for catching very small fish. While the
227 gigs of the present time are thus made of iron, the
[177] aboriginal spears were similarly shaped but were provided with points of hard palm-wood.

227 Another gig, made in the same manner as the last,
225 but usually with a heavier pole and heavier points, is used for spearing water-turtles, which are fairly abundant here. This gig is called pūtyū'lya, as well as hwe′ska or te′ska, and the only marked difference between it and the fish-gig just described is that its points have no barbs. It is said by the Indians that it is impossible to pierce the shell of a turtle with a barbed gig, but that the barbless point passes through the shell easily. The terrapins, or land turtles, having harder shells, are always caught by hand.

At the present time the hook-and-line is very much 221
used in fishing, though this was introduced by the [177]
whites. Strong, slender, fish-poles, called wañgū-tca'lī, seven to ten feet in length, are made from the upper branches of the large bamboo. They are gathered when thoroughly matured but while still green, and are hardened and straightened by heating. The lines, called wañgū-tcū'a, or sañ*dō'*a, are made of native pita string and are usually quite fine. The strength of the pita fibers makes it possible to use a very fine line for comparatively large fish. Such a fish-line, provided with a special pottery sinker and an ordinary steel fish-hook, is shown in fig. 9; it is wound in this case on a cylindrical piece of balsa. This line is called tcūndyē'pū and is used in the hand after the fashion of a troll. In case it should be dropped or pulled overboard, it is saved by means of the balsa float. Ordinarily all lines are provided with lead sinkers, but the pottery cylinder especially made as a sinker is an old type and was formerly very much used. Hooks, called weñgō'la, are now obtained from traders at the coast, although it is

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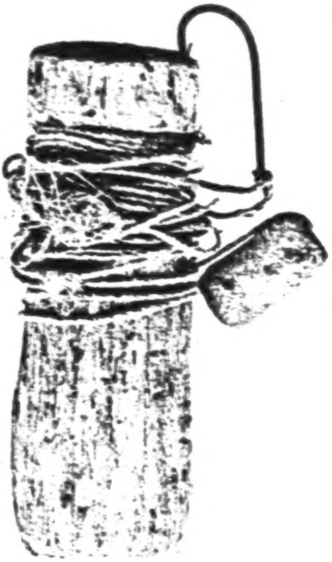

FIG. 9.—Fish-line with pottery sinker

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177 439 226 227 325 said that when this method of fishing was first introduced through contact with the early Spaniards, crude hooks were fashioned by hammering out pieces of iron.

226 At the present time this method of hook-and-line fishing is so much in vogue that almost every man has his special little canoe and a special short paddle which are used almost exclusively for fishing. It is customary to paddle for some distance against the tide or current and then to fish back down with the current along the bank. In this way little effort is required in paddling, and a sculling motion of the paddle with the left hand is sufficient to keep the canoe in its desired course. [227] With a pole and line go a small, hemispherical, calabash dish of angle-worms, a small bottle-shape basket (pl. XCIII, 3) of grasshoppers, or a calabash of a certain small reddish fruit, all of which are used as bait, each according to the kind of fish sought.

On rare occasions the trot-line, called weñgūtcū'a (?), such as that shown in pl. CXIX, 1, is used. The main line, called señgi'ri, is made usually of the coarser string fiber called by the Spanish term cosadera, while the small "leaders," called simply sañ*d*ō'a, to which each separate hook is attached, are made of pita string.

## WAR

76 The Cayapa maintain that in ancient times they rarely went to war, and then only on the greatest provocation, as, for instance, when they were harrassed by the former inhabitants of their present domain until forbearance was no longer possible and they descended from their

old mountain home at Pueblo Viejo and wiped their enemies out of existence. 121

In the only instance of war which the Cayapa describe fully, it appears that they organized themselves into war-parties and systematically invaded the enemy's territory. Predatory raiding was never practised by them, perhaps on account of their isolated position as well as by reason of their non-militant character. 721 726

The lance was the chief weapon used in war, though the bow and arrow seem to have been used to a slight extent in more recent times. The blow-gun with its poisoned dart was also used in war to some extent. It is claimed that the pre-Cayapa inhabitants of this region used throwing-stones with good effect. The sling, however, appears to have been unknown, the stones being simply thrown with the hand. 411 726

## MANUFACTURES

### Canoe-making and Canoeing

The rivers of the Cayapa region provide practically the only means of travel until the limit of navigation by canoe is reached. In fact, the streams provide almost the only means of travel at all, owing to the density of the jungle and to the fact that practically all of the Cayapa live along the rivers below the limit of navigation. The few trails through the higher mountains are almost never used except when journeys to the interior are made. On the other hand, there are various short trails extending back into the hills 484 487

[487] along these rivers—these are used for hunting or for
484 short trips from the rivers. All the permanent habitations
are situated along the banks of the rivers, and to
pass from one to another of these, as well as for making
trips of greater length, the dug-out canoe, called kūʹle,
502 is used. In fact, the canoe is one of the most prominent
features of Cayapa life. Everyone begins in early
childhood the training which makes him an expert
canoeman, and is perfectly at home in a dug-out, whether
it be along the smooth sluggish waters of the lower
course of the river, in the rapids of the upper course,
or out on the ocean coasting to some nearby point.

396 From the important place the canoe holds in the life
824 of the people, it is natural that much care should be
given to its construction and that the art of canoe-making
should have reached a high state of perfection.
Of the many species of trees in the jungle, only a few
produce woods which are hard and tough enough to be
suitable for canoe-making. These qualities are found in
certain species which have what may be called a criss-cross
grain, that is, an interlacing of the wood fibers
which makes splitting almost impossible. Though a
considerable degree of hardness is required, too great
hardness is not desirable. Certain woods, therefore,
such as the guayacan, are too hard and heavy to
be suitable.

396 Having found a tree of the desired kind, it is felled
[313] with an ax and the canoe is roughly fashioned from a
portion of its trunk, as is shown in pl. LXX, and finally
this section is cut loose from the remainder of the tree.

CANOE-MAKING

[p. 134 (A)]

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

SD6

CANOE-MAKING

p.134 'B'7

It is then roughly hollowed out with the ax, the sides and bottom being left considerably thicker than is desired in the finished canoe. Frequently it is necessary to do this part of the work at a considerable distance from the river, and even at a considerable elevation above one of the small creeks or esteros tributary to the river. Such was the case with the large canoe shown in pls. LXX, LXXI, which was made at a distance of nearly three miles from the river and two and a half miles from the navigable waters of the nearest estero. Furthermore, the tree from which the canoe was fashioned grew near the top of a ridge about three hundred and fifty feet above the floor of the narrow valley of the estero, and the sides of this ridge were so steep that it was necessary to snub the canoe down to the estero by means of a couple of stout cables. Having worked out such a canoe to approximately its final form, it is turned up on one side and bound to one or two vertical stakes, as shown in pl. LXX. At the same time it is raised a few inches off the ground by means of blocks in order to prevent rotting. It is then allowed to dry and cure in the shade for several weeks. 346

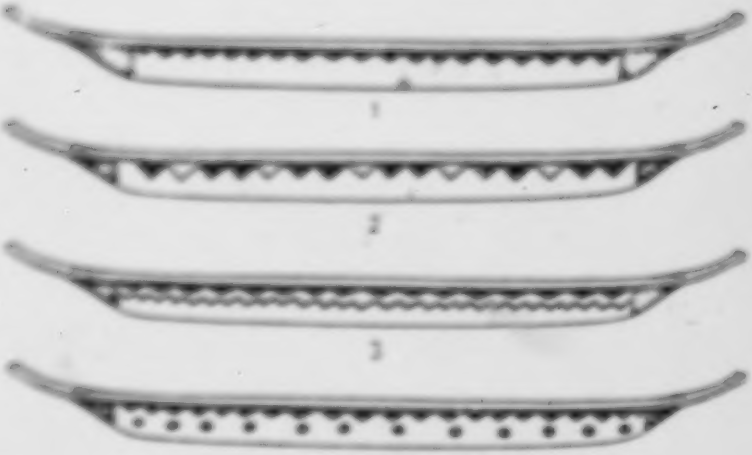
Finally the owner invites a number of friends to join in hauling the canoe to a point where it may be floated. This task may be a comparatively simple one if the canoe is practically on a level with the river, but if it is at a considerable elevation, much care is needed. Also, the size of the canoe is an important factor. A small canoe may be hauled by one or two persons; but a large one, say one twenty-five or thirty feet in 483 [476]

473 length, requires the labor of ten or a dozen persons. In the case of the large canoe shown in the illustrations three pairs of small holes were cut into its gunwales—one pair near each end and one at the middle—and to these were fastened three green wooden bars about an inch in diameter and projecting six or eight inches on each side of the canoe, thus serving as grips or handles for the haulers. The process of cutting the holes for these cross-bars is shown in pl. LXXI. Such bars must not be bound tightly to the gunwales, but of such looseness that they may be slipped in and out of the lashings, as is often necessary in passing close to a tree. A trail is carefully cut through the jungle, the trunks of small trees being thrown across it at intervals of a foot to four or five feet, in order to keep the canoe above the ground, thus greatly reducing the friction as the craft is moved along.

If the site of the construction of the canoe is at a considerable elevation, it must be let down carefully to the lower level by way of an incline. To accomplish this there are first wedged in at the prow and stern of the canoe two short transverse bars just below the
473 level of the gunwales. From a large tough vine or
284 aerial root, said to come from a plant called in the local Spanish matamba, and in Cayapa bi'ta, are twisted two-ply cables, such as that shown in pl. XCI, 5, and often as much as sixty or seventy feet in length. One of these is tied with a simple knot to each of the transverse bars above mentioned. The forward cable is passed with a half-hitch about the prow of the canoe and is

PLACING OF CROSS-BARS FOR TRANSPORTING THE CANOE

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6



DECORATIVE PATTERNS PAINTED ON CANOES

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bound securely at the point at which the cable crosses itself in making the half-hitch in order to prevent this from slipping off the prow. The one at the stern passes directly over the notch which is always present at each end of the canoe, and is bound to the point of the stern in such manner as to prevent slipping to either side, thus keeping the stress of the cable directly upon the short cross-bar and avoiding the danger of wrenching the bar loose by a sidewise pull. By snubbing with these cables, a large canoe may be lowered with comparative ease down a very steep incline. To accomplish this, a single turn is taken with the rear cable about the trunk of a tree, and by slacking off the canoe is let slowly down until the end of the cable is nearly reached. Meanwhile the forward cable has been passed about a tree and snubbed in the same manner to prevent accident to the rear cable. Having finally neared the end of the rear cable, the forward cable is made fast and the canoe held in position while the rear cable is taken down-hill and passed about a tree near the canoe in the same manner as above described. Then the two cables are paid out again until the end of the forward cable is reached, when the canoe is again halted and the forward cable taken down the hill as was the rear one. Thus, by this process of snubbing with the two cables, the probability of losing control of the heavy craft is eliminated. All this time, of course, the haulers are at the sides of the canoe helping to steady and guide it. One person only is needed to pay out each of the cables. Care is taken in snubbing a canoe down in this manner to see that

427 it does not slide from its course and strike a tree. Finally, when the bottom of the incline is nearly reached, both cables are released and the canoe is allowed to take its course over the remaining short distance to the floor of the valley, its momentum usually carrying it for some yards out on the plain.

Having reached the level of the estero or river, the hauling is now done entirely by hand until the canoe is finally launched. If launched in a small creek, it is often necessary still to haul it by hand for a distance down the creek, since it must be passed over sand-bars and even lifted over large logs, but small ones are always cut away. At last a point is reached where there is sufficient water to float the canoe down to the river. Sometimes, however, it is deemed advisable to haul the canoe only as far as a point on the estero known to be reached by floods; it is then tied to a tree until such time as the back-water of the river extends far enough to allow the canoe to be paddled down to the main stream.

396 In either case the canoe is finally taken to the house. If it is small, it may be taken into the house, but if a large one, it is more frequently placed under the house [427] or in a nearby grove of palms or trees. It must then be worked and smoothed by means of adz and planes until reduced to the required thickness, and the desired form and finish are obtained, when it is placed in a dry, shady place to season thoroughly before being calked and painted with brea. In adzing the canoe it is placed in a normal upright position and the inner surface

3: Barrett E-5 (1908-1909)1925

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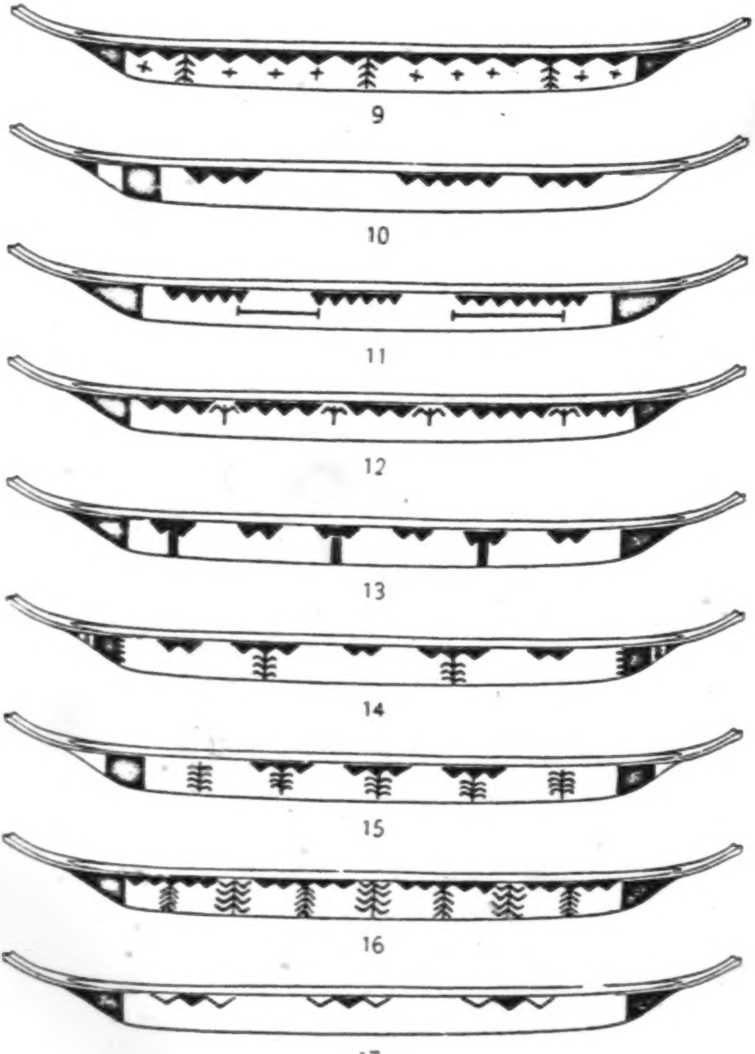
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DECORATIVE PATTERNS PAINTED ON CANOES

[p. 158 (A)]

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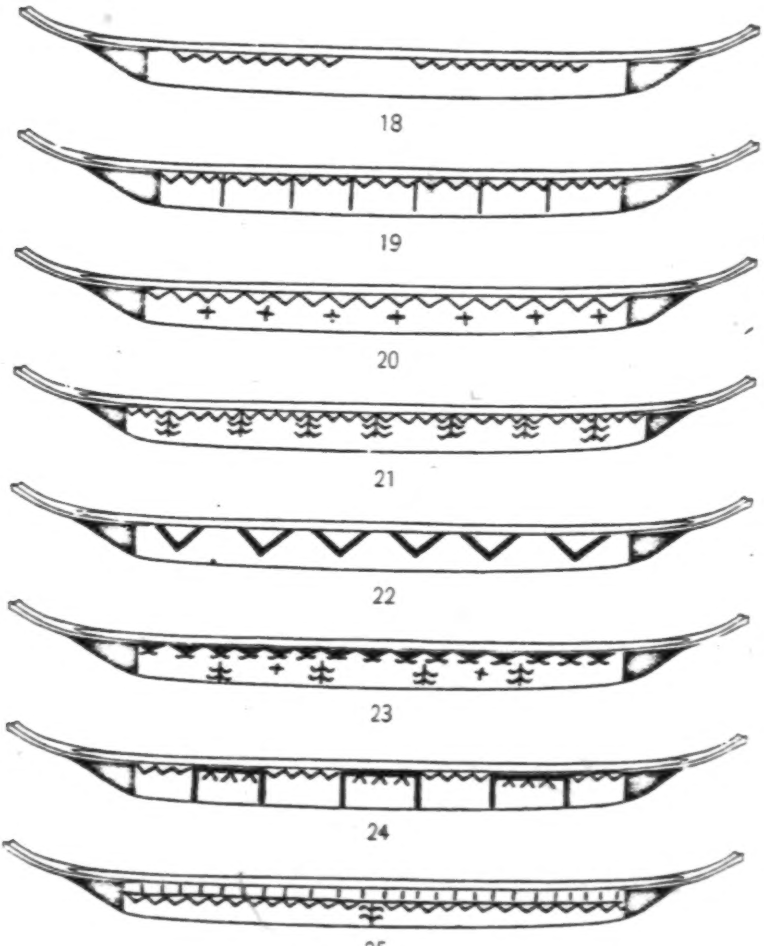
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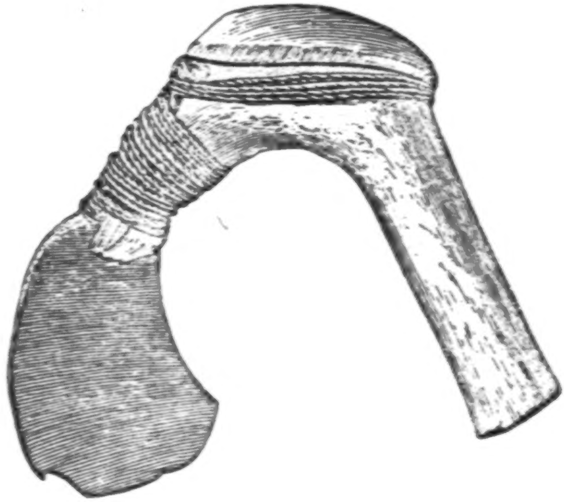
DECORATIVE PATTERNS PAINTED ON CANOES

[p. 138(B)]

adzed first. The inner sides are adzed first across the 396 grain and then diagonally to it, and finally the bottom is adzed in a similar manner. This work is done with a hand-adz such as that shown in fig. 10.

This tool is of modern introduction, as indeed are the 412 canoes themselves, as well as the method of their manufacture. [177] The blade of the adz is of steel and is made by local blacksmiths down the river. The wooden handle, shown in fig. 11, is made by the Cayapa, and is so constructed, with the large projection above and with the notches below, that the blade may be securely bound [284] to it, as is shown in fig. 10, by means of pita-fiber string. The blade is concave, and its edge is usually quite regular and curved, so that, while its full width may be



[284]

FIG. 10.—Modern adz used in making canoes

412 as great as four inches, generally not more than an inch of the edge is in actual play when a blow is struck. The particular adz here shown has a very uneven edge, due to chipping.

[177] The adz is called aswē'la and kū'le mûcte, both of which terms are derived from the Spanish, the second term signifying "canoe machete." The adz handle is called aswē'la tyapī.

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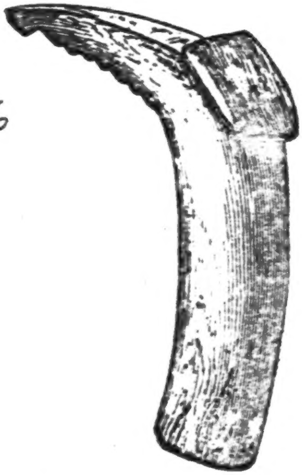

Fig. 11.—Handle of adz

With this hand-adz repeated light blows are struck along one line after another, the lines being parallel, and perpendicular or diagonal to the grain of the wood. By this means the wood is reduced to uniform thickness and the surfaces are rendered comparatively smooth. The final smoothing of the inside of the canoe is done with the adz, but upon the outer surface and along both the inner and outer edges of the gunwales the adzing is followed usually by more or less smoothing with planes, called sepī'ō or sepī'lyū, made after the fashion of the ordinary carpenter's plane. The sides of a large canoe are thus usually reduced to about three-quarters of an inch in thickness, the bottom having a thickness of between two and three inches. The prow and stern of the canoe are carefully cut to the exact form desired and finished with the adz, no plane being needed at these points.

3: Barrett E-5 (1908-1909)1925

SD6 Cayapa SD6

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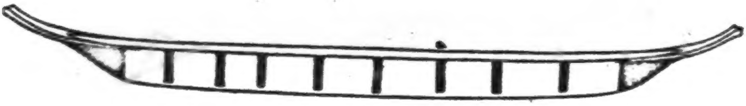
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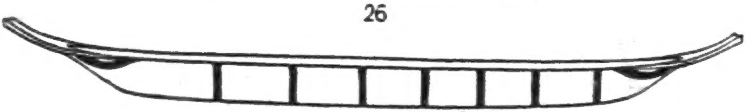
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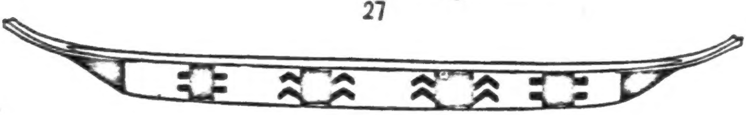
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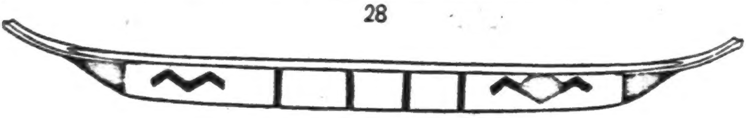
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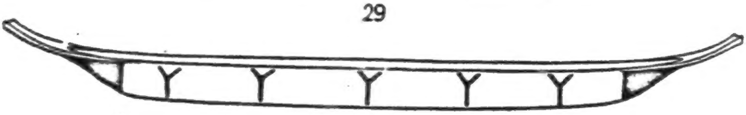
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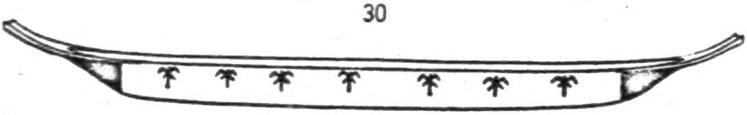
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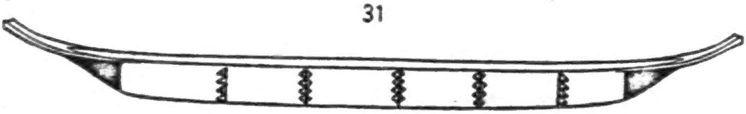
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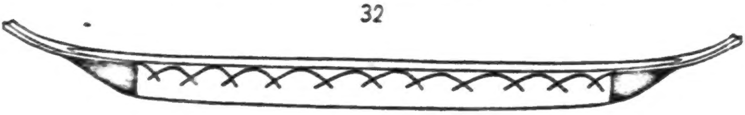
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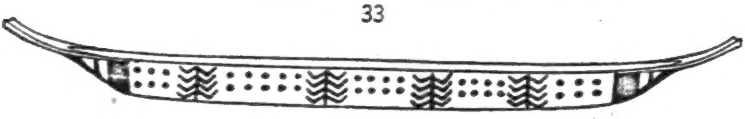
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DECORATIVE PATTERNS PAINTED ON CANOES

[p.140(A)]

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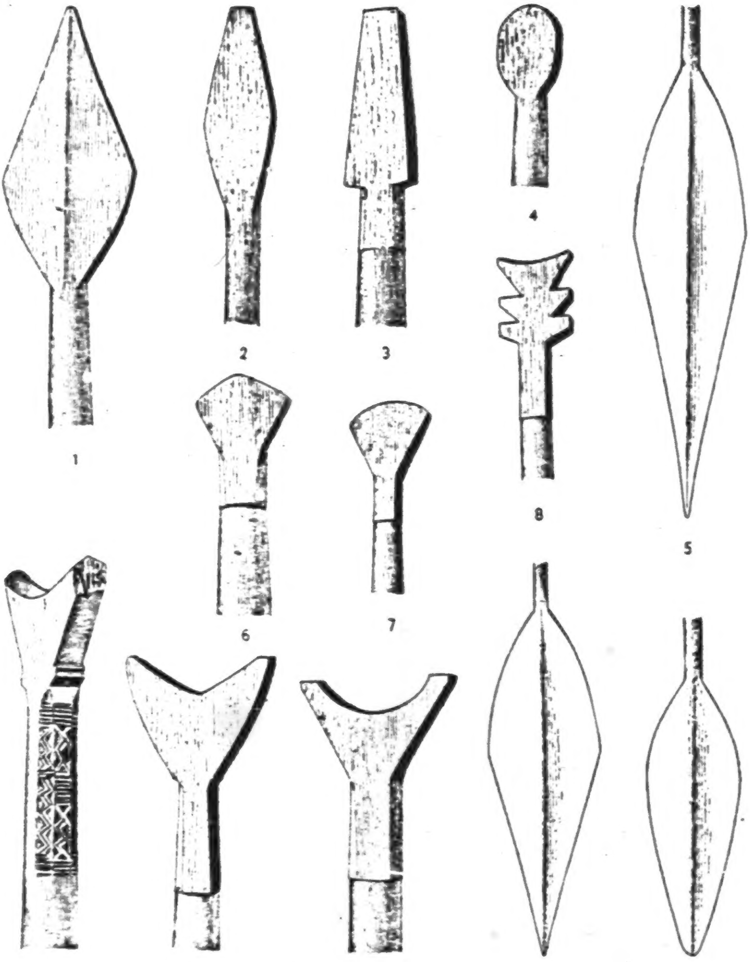
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PADDLE HANDLES AND BLADES

[p. 140(B)]

these points. The form of the prow and stern are characteristic, being very narrow and always very concave on the upper surface of the extreme point, as compared with the negro and the Cholo canoes of this region, thus giving this part somewhat the appearance of a pair of ears. These features are clearly illustrated in the canoes shown in pl. LX. At a distance of from five to seven inches from the extreme point of the prow, there is left a slightly raised line on the upper surface, while on the under surface, at a distance of about three inches from the point, appears a decidedly convex line. The Indians say that the former has no special use, but that the latter serves as a hand-hold in hauling the canoe when landings are made. These two features, together with the hole through which the small mooring cable passes, constitute the only differences between the prow and the stern of the Cayapa canoe.

In general the desired form of a canoe is exactly deter- 396
mined by sighting along it with the eye; but the prow and the stern are carefully measured in order that they may be perfectly symmetrical, and the height of the sides and the thickness of the bottom are similarly measured in order to give the vessel its proper balance.

Having completed the adzing and planing, the canoe is placed under the house and thoroughly dried before calking and painting. Treated in this manner it is of course less liable to check and is more durable. However, canoes are frequently used when green, and those made for sale in the settlements are in most cases only slightly seasoned.

396 The beeswax for calking and painting the canoe is boiled until of the proper consistency and adhesiveness; this is tested by dropping a small amount of the boiling wax into water and then pressing it between the fingers and also chewing it. The hot wax is applied with a
[142] brush about two inches in width, called kū′kū sapa, made of a chisel-edged section of the outer fibrous covering of the coconut.

396
531 The purpose of the wax thus applied to a canoe is strictly utilitarian. Along the outer surfaces of the gunwale, however, are placed various designs in wax for decorative effect. For this purpose certain stamps made of the light soft balsa wood are used. These stamps are of two forms: one, triangular, with a beveled end, is used for line figures and outlines of triangles and other solid devices; the other is cylindrical and its end is used for making dots. The former is called pī ke′ndū, the latter tsū ka′nū. The wax must in all cases be applied while very hot, when it soaks into the wood. In order to keep the wax at the proper temperature, the pot containing it is frequently re-heated, fresh wax being added as this is done. The painting with the coconut-bark brush may be done rapidly and requires little skill; but the making of designs with the dies must be done carefully in order to insure uniformity in size, shape, and spacing. Many canoe-makers, of course, use comparatively little care in this painting, especially on canoes intended for sale. However, a man who takes pride in his work is always exact in applying the ornamentation and spares no time or pains

in his craftsmanship. The less particular artisan simply 396
paints rude designs with a small coconut-bark brush. 531

The designs, called kū'm bīlya, used upon canoes are 501
varied. They are largely geometric, consisting chiefly 531
of dots, lines, and triangles, although sometimes animal figures are employed. These last, however, appear only on those canoes made by the Cayapa for sale. On pl. LXXII-LXXV are shown most of the designs used by the Cayapa on canoes made for their own use. They bear no special symbolic significance, none of them is typical of any special group of people, and no individual ownership is connected with any of them. In large measure they bear no names other than the generic kū'm bīlya, literally "canoe design."

As before mentioned, brea is the wax made by certain 237
small bees common to the region. It is called amū'ya, and is of two kinds, black and yellow, the latter being much preferred. The particular bees which produce the brea are of four different species. A small black bee, which lives in hollow trees and is called paba ta'nda, makes the wax of the best quality and in greater quantities than any of the others. Another small black species, called ta'nda also, lives likewise in hollow trees and makes much more honey than wax, but a certain amount of its wax is used. A third species is called ciñemi'skī; it is also black, but builds its nest in the ground and its wax is used to a limited extent. The fourth species is a small yellow bee called amūī a'ma; its wax is black.

Brea is obtained by smoking out the bees and chopping 222
237

open the log or chopping down the tree. None of these species of bees makes honey of any particular value, hence they are sought almost exclusively for the wax. The bees are very vicious, and therefore a certain amount of danger attends the process of obtaining the brea. In smoking out the bees, ordinarily a wide strip of green bark, about three feet long, or the large blossom bract of a large species of palm, is used as a case in which to place the green or wet wood and coals used to make the smudge. Near its ends this bundle is securely bound by two pieces of pitigua which project enough to make loops about fifteen inches in length, by which the apparatus may be carried about. When completed, this smudging device (fig. 12) is about ten or twelve inches in diameter and three feet in length. It is taken by a man, who has wound about his head and the other exposed parts of his body handkerchiefs or other pieces of

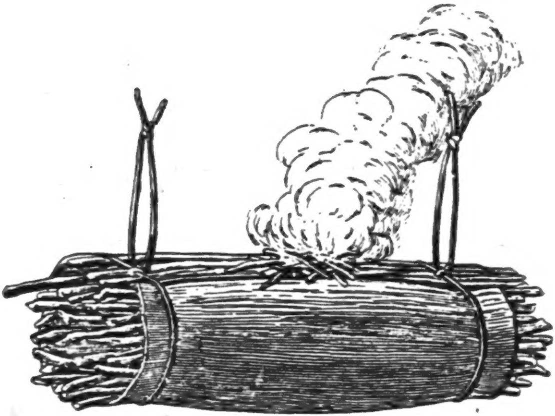

FIG. 12.—Device for smoking out bees

cloth, and is placed near the opening at which the bees 222
enter and leave the tree or log. The smudge apparatus 237
is then fanned until a volume of smoke is produced, which in time drives away or stupefies the bees and makes possible the taking of the brea. The wax is found in large blocks, usually at the bottom of the nest, and is cut out with an ax or a machete. It keeps indefinitely, and is stored either in the house or is buried in the ground until needed.

Shortly before or sometimes just after painting the 396
canoe with brea, a hole is cut in the middle of the prow
at a point just back of the slightly raised transverse 283
line upon its upper surface, for the cable by which the canoe is moored. This cable, called kondō′pī, consists usually of from two to four strands of carefully selected pitigua twisted together. Such a cable of three strands is shown in pl. XCI, 1. The length of the cable usually varies according to its diameter and the number of its strands, governed by the size of the canoe for which it is made. For very small canoes, frequently a single strand of pitigua is sufficient, but in most cases a two-strand cable is required; very large canoes have three-strand and sometimes even four-strand cables. In making a cable it is necessary first to twist each of the pitigua strands separately, the bark of the strands first having been removed. By means of this twisting the strand is rendered pliable, as well as stronger, since the fibers, which ordinarily would be parallel, are forced to twist around one another. The twisted strand is now wound round a hooked stick, such as that used in cleaning the

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cane and plantain fields, and is allowed to dry for a few hours, usually over night. The two or more strands to be twisted into the cable are next tied in a simple knot at one end and the strands passed, one or more, on each side of an upright support. Six or eight feet of pitigua are then unwound from the hooked sticks, and each stick is taken by a person and the pitigua twisted, all strands, of course, being twisted in the same direction. After a sufficient amount of torsion has been secured in these strands, another person takes up the knotted end of the cable and begins to twist the strands together on the opposite side of the upright. In reality he does not himself twist these strands together—he merely pulls sufficiently to bring them out on his side of the upright so that the accumulated force of torsion in the separate strands twists them together into a two- or three- or four-ply cable, as the case may be. This is done very slowly, the worker twisting and pulling here and there in such manner as to cause the strands to twine round one another evenly, producing a cable of uniform size and strength throughout. The strands are unwound from the hooked sticks as rapidly as they are twisted together on the opposite side of the upright, until finally, when the ends of the strands are reached, the cable is prevented from untwisting by another simple knot or by a more or less intricate weaving of smaller strands of pitigua about the main strands of the cable, as shown in the illustration above mentioned and in a manner similar to that represented in greater detail in pl. CIII, 19, 20. This last is the more usual form of securing this end of the cable, since it is necessary to have one end small in order to pass it through the opening in the prow of the canoe or for whatever other purpose it may be used. Ordinarily the cables are not tied about the prow of the canoe, but are simply passed up through the hole in the prow above mentioned, the knot in the cable below the prow holding it securely. 316 283

For ordinary purposes of travel and for carrying regular loads the canoe above described is sufficient. If, however, an excessively heavy or bulky and unstable cargo is to be transported, it is necessary to increase the buoyancy or to steady the canoe by means of outriggers, called by the Spanish name balsas, Cayapa na'na. In this region the term *balsa* has four significations. It is primarily a raft or float of any kind, and is the term naturally applied to the rafts of logs or bamboo which the Indians float down the river for sale at the settlements. The same term is applied to the outriggers used on canoes, as also to the tree and its wood from which these are made. This wood is very light, even when green or water-soaked, and when dry it is as light and soft as cork, qualities which make it very useful in numerous ways. The chief uses of balsa wood, however, are due to its buoyancy: it will carry in water much more than its own weight, and it is therefore used in rafting such heavy timber as guayacan. In this process, as many logs of balsa are procured as are necessary to sustain the weight of the guayacan, and these are lashed together into a float, the guayacan timbers being lashed on top of them. The guayacan timbers 501 505 313

505 are rafted down-stream for use as house-posts, but the
313 balsa logs are also readily sold in the settlements for making outriggers, since they are much used on the imbaburas, or very large canoes, employed to lighter cargoes to and from sea-going vessels.

501 Among the Cayapa such outriggers are sometimes
505 used, but ordinarily the Indians travel with a cargo so light that the outrigger is not needed. When, however, it is necessary to increase the carrying capacity of a canoe in this manner, logs of balsa from four to eight inches in diameter are cut the proper length, and their forward ends are brought to a form more or less like that of the prow of the canoe. At the middle of the canoe is bound, by means of the two small holes in the gunwales (mentioned as being used in the hauling of the canoe from the woods to the river), a cross-bar of sufficient length to project far enough on each side of the canoe to permit the binding of these logs to it. In binding the logs to this middle transverse bar a block of wood, three or four inches in thickness, is inserted between the upper surface of the log and the bar, thus forcing the log farther into the water at this point. The forward and after ends of the log are each lashed to a similar small hole in the gunwale near the prow, and the stern respectively, these ends being brought up nearly to a level with the gunwale itself and thus three or four inches higher than the middle of the log. In the case of very large canoes, and especially of the imbaburas above mentioned, sometimes as many as three of these logs, as much as a foot or more in diameter, are lashed

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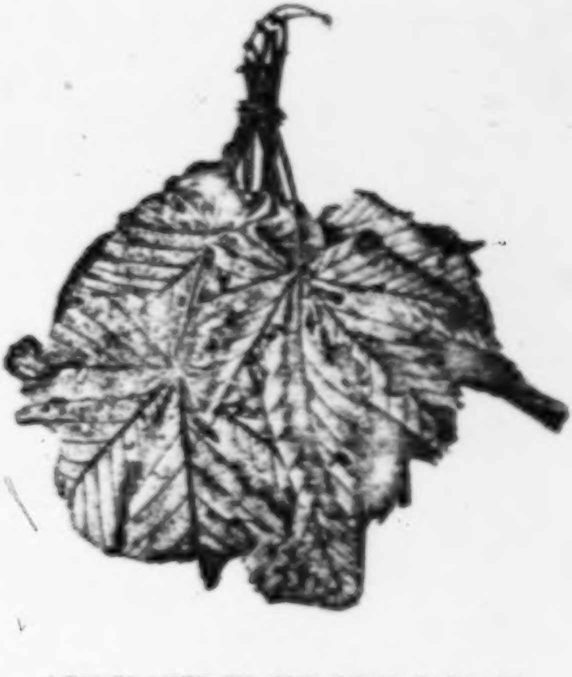

LEAVES USED TO RUB DOWN PADDLES

[p. 148(A)]

side by side to each gunwale, thus really converting the 501
canoe into a raft. With canoes of ordinary size, how- 505
ever, one log on each side is sufficient. If more than one log is used on each side, it is necessary, instead of binding the forward and after ends directly to the gunwale of the canoe, to bind them also to transverse bars which pass across the prow and stern in the same manner as above described in lashing them at their middle points.

In pl. LXXVI, 5, is shown a typical new blade of a 501
man's paddle just after completion. A comparatively short time only is required to wear down the sharp point until it has more the appearance of the point of the blade shown in 13 of the same plate. The general contour of the blade shown in this illustration is one rarely seen among the Cayapa, but it is common among the negroes of the region. In fashioning a paddle of either type a pronounced ridge is left down the middle of each surface. Along this line the blade reaches a thickness of about three-quarters of an inch. At each side of these medial lines the blade is hollowed out very much after the fashion of a hollow-ground razor; otherwise its thickness is fairly uniform. The thickness of the blade decreases slightly toward the edge, so that the edge itself at the greatest width of the blade rarely exceeds three-sixteenths of an inch in thickness, and it may be as thin as an eighth of an inch.

The handles or poles of the paddles are ordinarily from an inch to an inch and three-quarters in diameter and are almost perfectly cylindrical. They taper slightly from the blade to the upper end, or what may

50 be called the grip. In a woman's paddle this end may be truly called the grip, and it is usually notched in more or less of a fish-tail form, shown in pl. LXXVI, 9 to 11. This notch is quite smooth, and is actually gripped by the hand. In the case of the man's paddle, however, a purely ornamental tip is put on the end, which is almost never touched in paddling. A few of the typical forms of these ornamental ends are shown in figs. 1 to 4 and 6 to 8 of the same plate.

[53] Occasionally various simple figures are carved either in relief or in intaglio near the upper ends of the paddles. An illustration of such carving relief is shown in pl. LXXVI, 9. Such ornamentation is seen frequently on women's paddles, but only occasionally on those of the men.

[524] As a finishing touch to paddles and in order to make them perfectly smooth, especially along their handles, they are rubbed down with the under-surface of a dry leaf called Iya'pic baki, which is covered with minute but very hard spines that serve the purpose of sandpaper. A bunch of these palmate leaves is shown in pl. LXXVII.

502 516 Although on a long journey a woman may act as pilot of the canoe, a man sometimes serves in this capacity while the woman sits forward and paddles, as shown in pl. LXXX. Again, it is customary for the woman to use the short paddle on all occasions, but now and then she may be seen using the man's long paddle. Such an instance is shown in pl. LXXIX, where the pilot of the canoe in the foreground is a woman using one of

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CANOEING ON THE RIO CAYAPAS

[p.160(a)]

3: Barrett E-5 (1908-1909)1925
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CANOE PILOTED BY A WOMAN
[p.150(b)]

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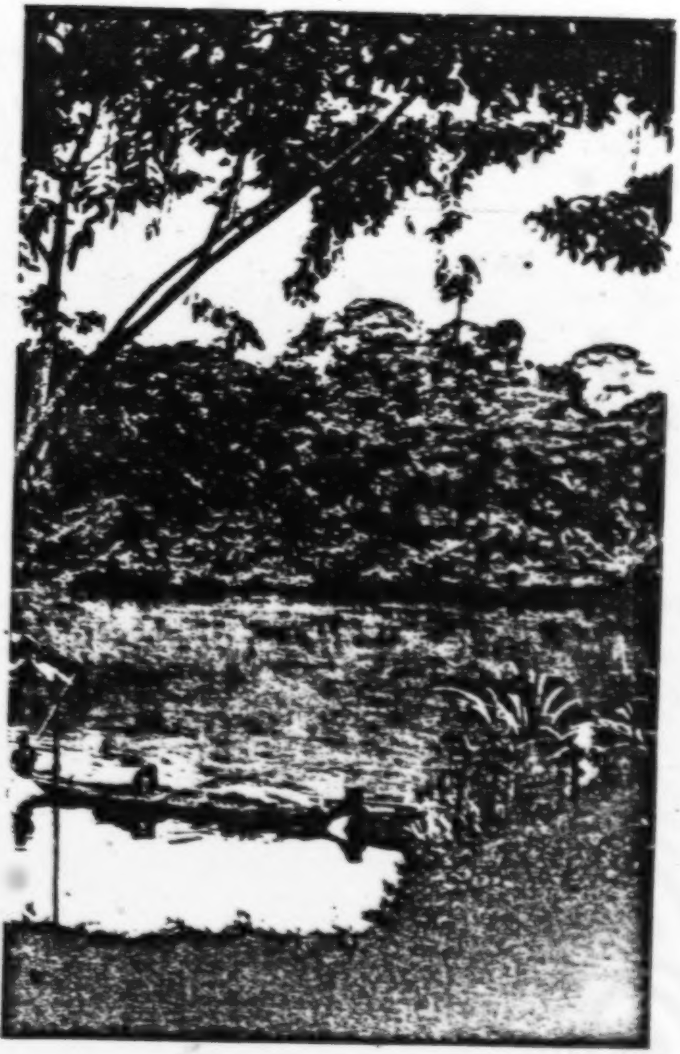
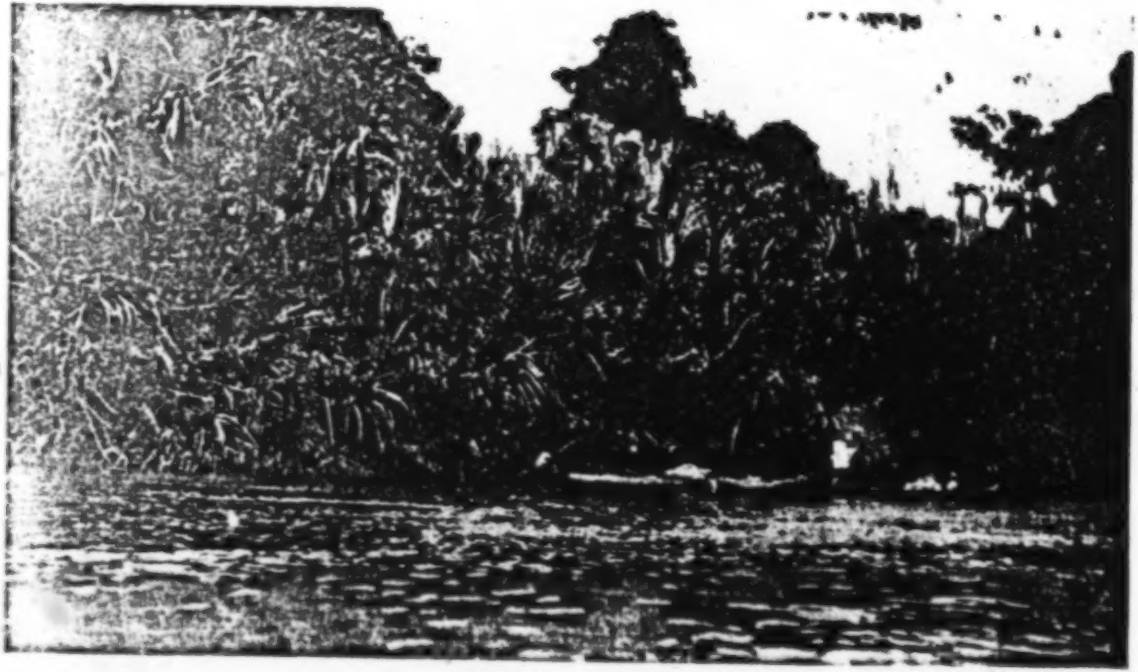


CANOE PILOTED BY A MAN
[p. 150(c)]

[p.150(a)]



CANOEING ON THE RIO CAYAPAS

the long paddles, and the woman sitting forward is 502
paddling with one of them. From these illustrations 502
may also be gained a good idea of the custom of loading 505
a canoe. While in some regions the Indians and also others using canoes endeavor to place the load fairly well aft in order that the prow will point considerably upward, the Cayapa aim so to load their canoes that the ends will practically balance and the canoe will ride as nearly as possible level in the water. They claim that their canoes ride more easily and swiftly when laden in this manner, and also that if it is necessary to load the canoe in such manner that it is not well balanced, it is better to place the cargo forward rather than aft, since if the stern is too low in the water it impedes progress.

As above mentioned when speaking in general of the 501
sizes and uses of canoes, the one used on long journeys and with a carrying capacity of several people is necessarily of considerable length, while on the other hand the man's special fishing canoe is often not more than ten feet in length and frequently does not exceed twelve or fifteen inches in width. All the canoes shown in pls. LXXVIII-LXXXII are of the large type, or what may be termed family canoes, which range from eighteen to thirty-five feet in length.

Some families go very rarely down to the coast; 505
indeed on the extreme upper waters of the Rio Cayapas 484
and the Rio San Miguel there are a few individuals past middle age who, it is said, have never seen the ocean. Most families, however, go at least once a year, while

Most families, however, go at least once a year, while
505 those living on the main Rio Cayapas and its tributaries
484 to the limit of tidewater, which is just above the con-
[439] fluence of the Rio Camarones with the main river,
usually go down to the coast several times a year, each time taking with them a load of various commodities such as plantains, tagua, rubber, and cacao, for sale. For such a journey from two to several days are required, and each member of the family must take along his mosquito canopy, his strip of bark cloth which serves as a bed, and other necessary personal articles, while the party must be provided by the women with cooking utensils and food for the journey. Each member is usually bedecked in his best clothing and necklaces, and it is customary also to paint elaborately the exposed parts of the body, as is done on the occasion of a fiesta.

For the protection of the small children, a mat, such as that shown in pl. CVI, 2, is placed with its two ends just inside the gunwales of the canoe so that it bows up in the form of a canopy. Such a protection is shown in pl. LXXX. The cargo of the canoe is always protected from rain with hoja-blanca leaves, or now and then with large plantain or banana leaves. In the Cayapa country, where it rains practically every day, a downpour never hinders one from making a journey. An ordinary rain is met without protection, but if it is very severe one may be well sheltered by holding up a large plantain or banana leaf on the windward side.

505 It is unnecessary to provide a camping outfit in this
484 region, since hospitality is a custom of the country;
[illegible] consequently in making a journey it is necessary only

to reach some house for the night. It is immaterial 505
whether the resident is an old acquaintance or a perfect 484
stranger, for the traveler is assured of a welcome. 574

Under ordinary conditions a journey down-stream 502
with the current is easier and more rapid than one up- 484
stream. However, the effect of the tide retards down-stream travel to some extent, but this is compensated by the aid which it gives while one journeys up-stream. It is in all cases customary to travel with the tide, either up or down stream. When going with the current the middle of the stream is taken, as shown in pl. LXXIX, where a canoe is illustrated going down-stream in the middle of the river; but when necessary to travel against the current, the side of the stream is taken. In the illustration mentioned is shown a second canoe making its way along near the bank and against the current.

For ordinary propelling under all such circumstances 502
the paddle is exclusively used, though a man's paddle with its long handle may be temporarily converted into a pole when shallow water is reached. When a strong current is encountered, as is the case along the upper courses of the streams or when going against a flood, regular poles, such as those already described, are needed to propel the canoe. Every person in the canoe, including the children, carries his own paddle and is expected to use it almost constantly throughout the journey. Ordinarily in the large canoes not more than two poles are carried, and for a moderate current the pole would be used only by the man in the extreme prow, who frequently stands out on its flat surface as shown in

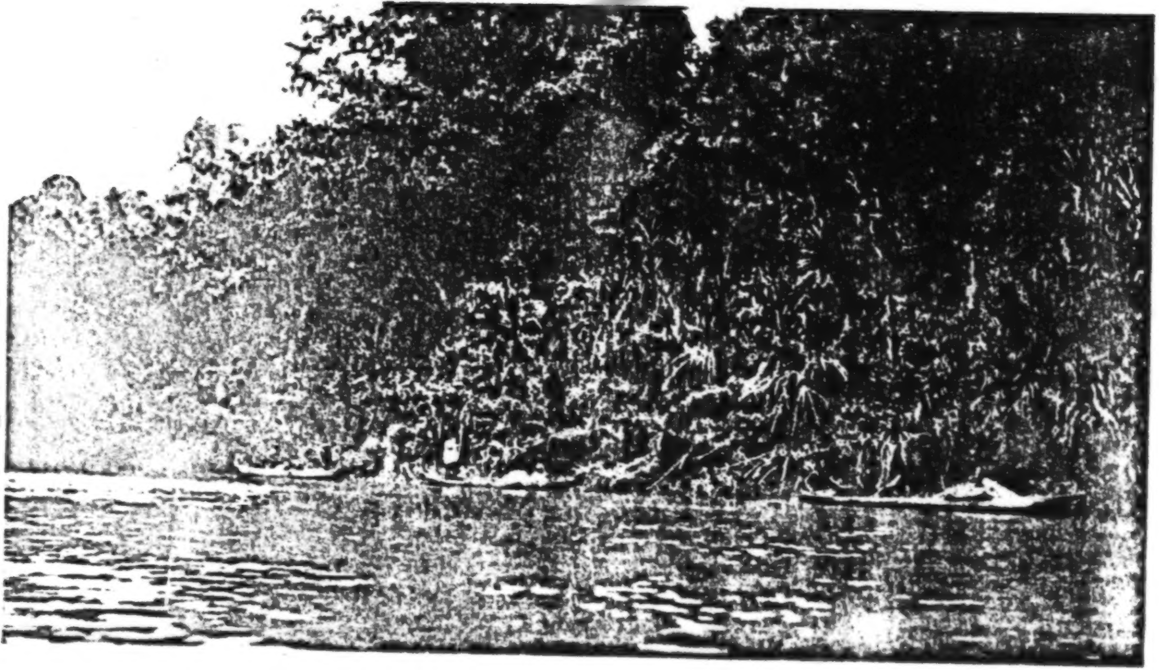
502 pl. LXXIX, instead of down in the canoe itself. A paddler standing down in the canoe ordinarily bears his whole weight upon one foot, the other foot being placed upon the gunwale and thus serving both to steady him and to counterbalance the tendency of the canoe to list toward the side on which he is paddling. The stroke of the man's paddle is, by virtue of its length, a long, slow sweep, the blade only being immersed. On reaching the end of a stroke, the paddle is swung in an arc out from the canoe over the surface of the water and again dipped gently and without splashing. The stroke of the woman's paddle, on the other hand, is, by virtue of the shortness of its handle, a short and rather jerky stroke, and she ordinarily takes three or four such strokes and then rests for a moment before taking the next three or four. A man, even when sitting and consequently using only a short length of the handle of his paddle, takes regularly timed strokes, and his whole act of paddling is even and rhythmic.

## WOODEN IMPLEMENTS

322 Implements and various other objects of wood are made to a considerable extent by the Cayapa. These will be treated here as a class, although it will be necessary to include under this head objects devoted to many different uses.

322
352 Perhaps the most interesting of the various wooden objects used by the Cayapa are the seats or benches called tcũmbũ'lya. These are of several different types, as shown in pl. LXXXIII, 2-6, 8. They are usually

[p.154(A)]



CANOEING ON THE RIO CAYAPAS

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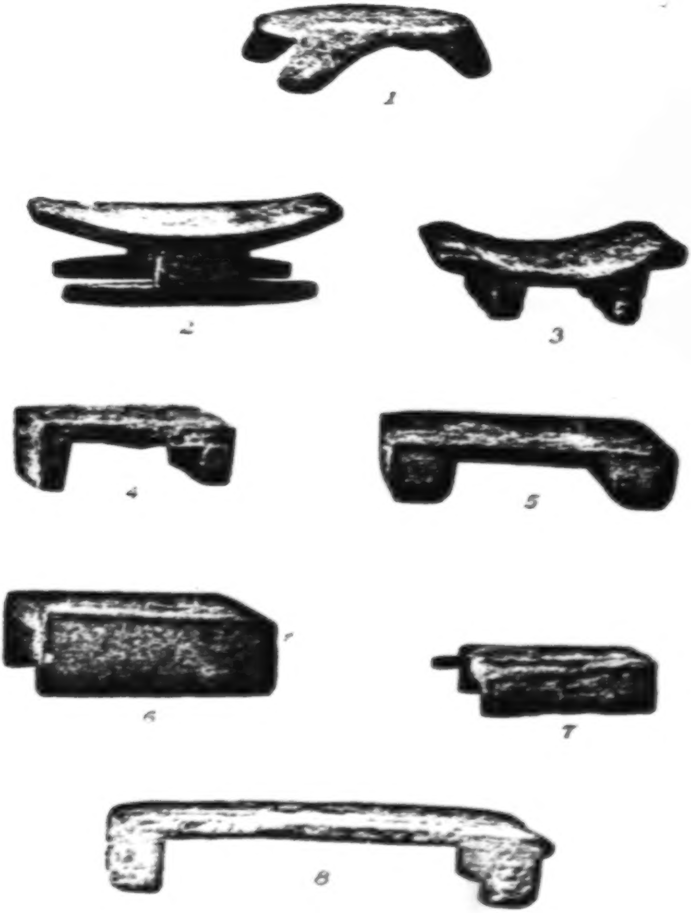

WOODEN SEATS AND BASES

[p.154 (B)]

about six inches and never more than eight inches in height, are from six to nine inches in width, and from a foot to two feet in length. They are always hewn from a single block of wood and generally have two supporting surfaces. 322 352

In the most common form these supporting surfaces are narrow lines running with the grain of the wood and therefore along the long sides of the seat. This type of seat, an example of which is shown in fig. 6 of the plate, is made by simply hollowing out the underside of the block so that the upper part of the seat proper is from an inch and a half to two inches in thickness, while the sides upon which the seat rests extend to the floor and are usually not more than from one-half to three-quarters of an inch in thickness at their bottoms.

A second form is that in which the supporting surfaces are transverse to the grain of the wood, and are made by cutting out from the middle of the under-part of the block a section of the required length. Examples of this type of seat are shown in figs. 4 and 5 of the same plate. Fig. 5, in which the under-side of the comparatively thin upper part of the seat is perfectly straight, shows the more common of the two forms.

A third form is practically the same as the last mentioned except that the thick transverse supporting surface is cut out in its middle so as to form four cylindrical posts or legs. Such a seat is shown in fig. 8 of the plate. This is an exceptionally long seat and is quite sufficient to support two people.

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171

In these three types of seats the upper surface is perfectly flat, but in the two types shown in pl. LXXXIII, 2, 3, this upper surface is more or less concave. Both have forms somewhat suggestive of the large stone seats which are such a unique feature of the archeology of the province of Manabi. This is especially true of the form shown in fig. 2. Here are two long supporting surfaces which rest upon the floor and support two upright pieces which in turn support the upper curved part of the seat. If this is compared with certain of the Manabi stone seats,[13] a striking resemblance is found. Instead of the under-part being cut away, as in the case of this wooden seat, the Manabi stone seat is solid. It has, however, a broad, flat footing comparable with the two long wooden strips upon which the Cayapa seat rests. Upon this broad footing is a very much narrower supporting column on the top of which rests the concave upper part of the seat. This narrow column is carved into an animal form, so that the resemblance of this seat to that of the Cayapa wooden seat is not so great when viewed from the front as it is if seen from the rear. There is now, of course, no means of determining whether there is any connection between these two forms of seat, but the fact that these two similar types exist, the one being part of the remains of an ancient culture and the other a type of seat made and used at present by the Cayapa, is very interesting.

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[13] See Saville, M. H., The Antiquities of Manabi, Ecuador, *Contributions to South American Archeology, The George G. Heye Expedition*, vol. II, pl. xxxv, figs. 1–3, New York, 1910.

The wooden seat shown in pl. LXXXIII, 3, is in all essen- 322
tials the same as that shown in fig. 2 of the same plate, 352
except that the broad support of the two narrow strips at the bottom is not present. The bottom of this seat, like those of the seats shown in figs. 4 and 5, is made by cutting out a transverse section from the middle of the block so that the two supporting surfaces are sections which run transversely to the grain of the wood. In the seat shown in fig. 2, on the other hand, the center is cut out in the opposite direction, that is, with the grain of the wood. Neither of these types of seat with the concave surface is very commonly used.

These wooden seats are found in almost every Cayapa 352
house, although they are not used so frequently as 516
might be expected. Ordinarily if a man wishes to sit down he uses the hammock, which serves primarily as a baby cradle. It is so swung that its ends are not more than ten to twelve feet apart, and he is able to sit almost erect and lean back against the end. Also the raised platforms at the sides of the house serve as seats. The women and children usually sit upon the floor, although occasionally a bench may be used by one of them, especially by a woman who wishes to spin. In large measure, however, such seats are used by visitors or by the men of the house when it is necessary to sit at some particular kind of work, such as sharpening machetes, adzing and planing paddles, and the like.

A wooden device similar in form to these seats is the 412
base upon which the whetstone used for sharpening

412 the machete is mounted (pl. LXXXIII, 7). Practically the only difference between this object and a seat such as that shown in fig. 6 of the same plate, is in the presence of the handle at one end. Both the whetstone base and the wooden seat is called tcūmbū'lya.

[439] The whetstones, called tōla'ha, are made of a fine-grained sandstone and are purchased from the settlements down the river. A stone of almost any size is used, but one six by eight or ten inches is most usually employed. It is not fastened to the base, but simply rests upon it in order to bring the stone a few inches from the floor and to make it possible to place the hands on either side lower than the stone when necessary. With this simple apparatus and a hemispherical calabash of water to wet the stone a man will sit and sharpen machetes for a couple of hours at a time, especially when the cane-field is being cleaned or a new area in the bush is being cleared.

352 In fig. 1 of the plate last referred to is shown another wooden object similar in form to the seats. This is the special wooden base used as a rest upon which to set an earthenware pot as it is being coiled and shaped. Ordinarily these bases consist merely of a flat board of rectangular form. The one here shown is much more elaborate, being circular in outline and having four legs which slant outward from its perimeter; it is also hewn from a single block of wood, as are all the objects represented in this plate.

524
532 Another interesting class of wooden objects is dolls, called nawa'wa, made for the amusement of children.

These are carved from single blocks of wood and represent a variety of animate objects. Chief among them are human figures, both male and female; next follow mammals and birds, and now and then alligators are represented. In pl. LXXXIV, 1 to 5, are shown typical dolls representing human figures. The simplest of these, shown in fig. 4, is a cylindrical block of wood with carved head and face. From such simple forms dolls range through various stages of detail to well-carved figures such as that shown in fig. 5, in which the parts of the body are carefully represented and an attempt is made to imitate the cropped hair of the men by carving a raised band about the head, although the doll is evidently intended to represent a woman. The fact that the hair is thus represented is perhaps due to the inability of the workman to carve the long flowing hair of a woman. 524 532

Animals and birds of various kinds are carved more or less perfectly. Examples of these are shown in pl. LXXXIV, figs. 6 and 8. Fig. 7 of this plate represents a well-made figure of an alligator. Some of the figures, as for instance this alligator, are made of very hard wood, dressed and smoothly rubbed.

Dolls are about the only playthings, other than small pots, baskets, and other utensils, that the children have, for, as already stated, the Cayapa have practically no games.

In pl. LXI are shown several implements of wood, all of which are used primarily in cooking. In figs. 1 to 5 are illustrated typical mashers, called matcō'ka, 415

415 used especially for crushing ripe plantains in making the gruel already described. Some of these mashers are perfectly plain, consisting of a cylindrical stick with a large flat end (fig. 4), but most of them are more 415 or less ornate, especially at the upper end. The simplest 531 type of this ornamentation is that shown in fig. 2, in which the upper end of the masher is of a form similar to that of the lower end, but is considerably smaller. Various other forms of ornamental ends, with or without notches, are made; two of these are shown in figs. 1 and 3. Occasionally also some ornamentation is found along the handle, and especially toward its lower end, as shown in fig. 5.

415 Another wooden implement of special use is the chocolate stirrer, called tcōkōla'*te* tca'lī, two specimens of which are shown in pl. LXI, 6, 7. These stirrers always are provided with lateral projections at their lower ends, by means of which the stirring is done, the implement being twisted rapidly back and forth—between the [272] palms of the hands. Chocolate is rarely used by the Cayapa, but when prepared as a beverage it is usually boiled in a pot somewhat similar to that shown in 415 pl. LXXXVII, 9. The chocolate stirrers also are sometimes 531 ornamented at the upper extremity, as shown in fig. 7, or directly above the four lateral projections at the lower extremity, as in the one illustrated in fig. 6. In the latter case the ring of small ridges projects almost if not quite as far as do the four lateral projections, hence the ridges serve to stir the chocolate as well as do the projections. Whatever useful purpose this ring

of small ridges may now serve, however, it seems to 415 have had its origin in a desire to ornament the stirrers, 531 since most of them are plain at that point (as is the one shown in fig. 7), and because various stirrers of this form have carvings at that point which are similar though much smaller and are obviously purely ornamental.

A second form of stirring implement is the food 415 paddle, called kũwi'ñgi, two specimens of which are shown in pl. LXI, 8, 9. These are used for stirring all kinds of foods while cooking, but especially ripe plantain gruel and a kind of gruel or mush made from green corn. In many cases these paddles are perfectly plain, as is [531] the one shown in fig. 9, but now and then they are embellished with notches or incised ornaments as is the case with the one shown in fig. 8.

A utensil in common domestic use is an elliptical [171] wooden bowl, copied after a type made by the whites and negroes of the region and bearing only the Spanish name batea. They vary more or less in their elliptical form, but a typical specimen is shown in pl. LXII, 4. They are always provided with a projection at each end to serve as handles. They are hollowed out from a single piece of wood, and range from a foot to three feet in length. Bateas serve a variety of purposes, [252] but they are used especially for the preparation of certain foods, such as ripe plantain gruel, corn gruel or mush, and the like. They are used also as trays for [323] washing meats or other foods, and frequently are employed in mixing and working clay during the process of pottery-making.

415 pottery-making. A shallow wooden tray, like that shown in fig. 3, is sometimes, though much more rarely, made by the Cayapa for similar purposes. It also is called batea.

[272] Somewhat similar in form to the batea is the canoe-shape dish, called tcambôs kö'le, used in serving the drink or gruel called in Spanish champo and in Cayapa tcambô'se, which is made from green corn. This is made exactly after the fashion of a canoe, with the characteristic prow and stern ends, and ordinarily with the painting along the gunwales as well as upon the prow and stern. It is usually from two and a half to three and a half feet in length, and is much wider in proportion than the river canoe, being ordinarily from ten to twelve inches in width. As mentioned in speaking of the uses of corn, the champo dish is used only at fiestas for containing champo and on rare occasions the ripe plantain gruel called ma'la.

[252] Another wooden utensil is a heavy mealing block used especially for pounding green plantain to make the food called in Spanish bala and in Cayapa panda lö'*ta*. Such a mealing block, shown in pl. LXII, 1, may be compared in form and size with the average stone used for the same purpose. In fact, these blocks are much less frequently used than mealing stones, such as that shown in fig. 2. The mealing blocks are usually more or less elliptical in form and about eighteen inches in length. With such a block is always used a stone muller.

Various other implements are made of wood, but

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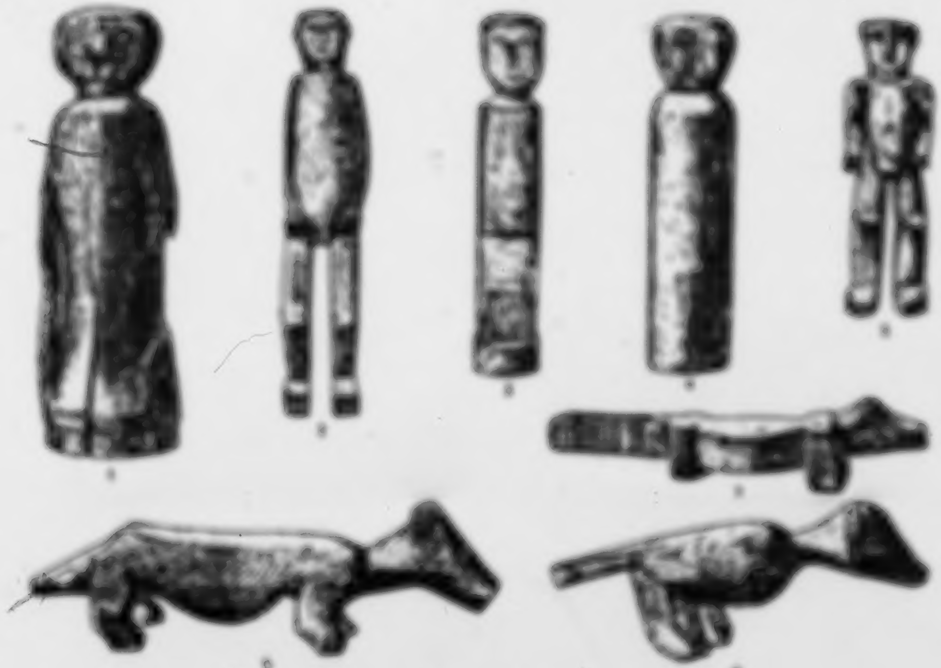
BARRETT—CAYAPA INDIANS

PL. [illegible]



CARVED WOODEN TOYS

[p.162(c)]

BARRETT—CAYAPA INDIANS

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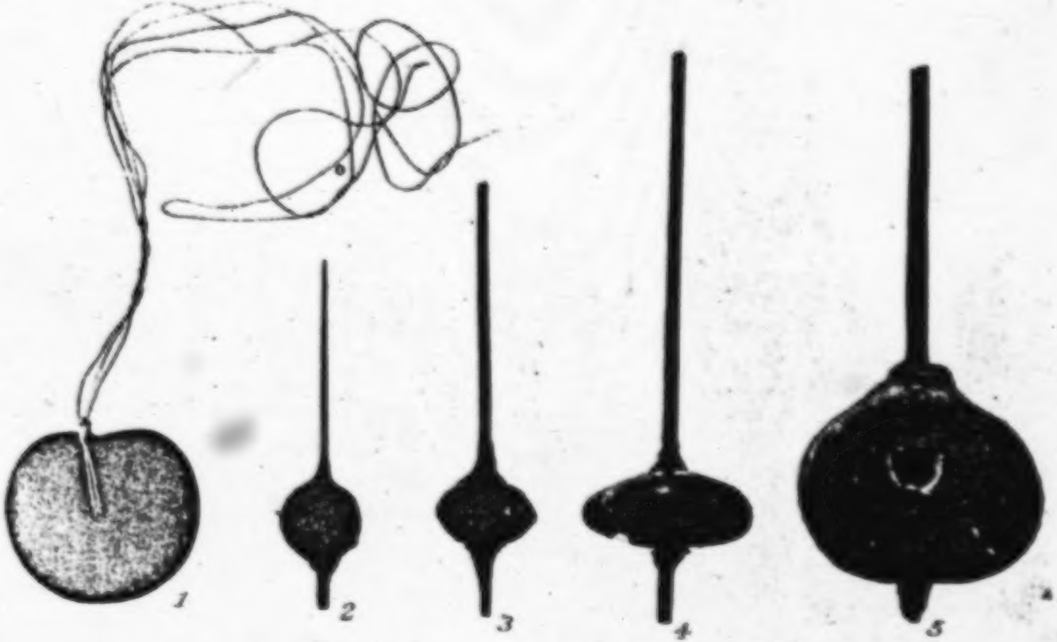
PL. LXXXV

p. 162(F)



MUSICAL TOPS

3: Barrett E-5 (1908-1909)1925
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most of these have been or will be discussed in other sections of this paper. Among these objects are hooks for suspending various commodities and for use as a fish-pole rack; spinning and weaving implements; mesh sticks used in the manufacture of cordage and netting; mauls for beating out bark cloth; the condensing board or "worm" employed in distilling, and stamps for body decoration and for canoe painting.

### STONE IMPLEMENTS

The stone implements used by the Cayapa are confined almost entirely to the mealing stone and the muller. 324 415 The former is usually a flat stone from eight inches to a foot in width, from a foot to two feet in length, and five or six inches in thickness. The upper side is slightly hollowed by means of pecking with an old ax or other heavy iron implement. Very few of these mealing stones are made at the present time; indeed few modern mealing stones are now in use. [172] A similar type of stone was used by the former mound-building inhabitants of this region, and from these mounds and old village-sites the Cayapa now obtain practically all the mealing stones needed for their use. In pl. LXII, 2, is shown one of these stones of the typical, modern, Cayapa form, in which the depth of the hollowed upper surface is comparatively slight, but usually the mealing stones obtained from ancient sites are hollowed to a somewhat greater depth. The hollowed portion extends over almost the entire upper surface. Along the sides and generally at one end there is left a ridge to

324 retain the foods which are crushed and pounded upon it. 415 Usually at the opposite end there is no such ridge, the opening serving especially in grinding green corn.

With this mealing stone, and also with the mealing block (pl. LXII, 1), is used a muller consisting usually of a cobblestone from five to seven inches in length, three to four inches in width, and two or three inches in thickness. Sometimes such a muller is shaped artificially. A typical muller is shown in place as it is used on the mealing stone in fig. 2.

252 The mealing stone and muller are used primarily for making what in Spanish is called bala, boiled green plantain mashed and pounded. From one to half a dozen green plantains are put on the mealing stone, then rolled lightly and mashed with the muller, after which they are pounded with considerable force with the muller held in the right hand while the left is used between strokes to return the fragments of plantain, which have been thrown off by the force of the blows, to the center of the mealing stone. From ten to fifteen strokes of the muller result in a mass of fine-grained but soggy plantain of a light-yellow color. This resembles in texture a piece of half-baked bread-dough and is much esteemed by the [264] Cayapa and also by the negroes. The women and girls usually prepare the bala for the men and boys, and serve it on plates, or, in the more primitive fashion, upon the cooking leaves called ū'tya haki. After the men and boys have been served, the women and girls then make bala for themselves, which they eat directly from the mealing stone. After the meal, the muller is laid upon

the floor and the stone inverted over it to keep its grind- 252
ing surface away from the dogs. When again needed it 252
is cleaned by taking a cooked plantain, grinding it upon 264
the stone, and rolling it around thoroughly over the grinding surface. This process takes up all the fragments of plantain left from the previous grinding, and thoroughly cleanses both the mealing stone and the muller. The ridges on the two sides and one end of the mealing stone help to keep the plantain from flying off during this grinding. The lack of a ridge along the second end, however, is of advantage in grinding green corn, which process has already been described.

Now and then the mealing stone and muller are used 356 for treating other products, such as the inner pulp of the fruit of a tree called ma'ĩñ-tci, which is ground and mixed with balsa charcoal to make the black face-paint called ma'lyũ.

The only other native stone implement is that used as 227 a sinker on the seine and the casting net. These sinkers are simply waterworn pebbles ranging from two to four inches in length and from an inch to two inches in diameter. They are called cũpũ'ka, a general term signifying stone, and appear to have no special name. In large measure these pebbles, unworked, are rolled in the leaf called ũ'tya haki and tied directly to the lower edge of the net; but now and then are found sinkers of such form that they are likely to become detached from the net, hence these are provided with rough notches or even surrounding grooves.

Certain smooth stones, and especially black ones, are 755 used in treating the sick.

### Calabash Implements and Utensils

415 177 245 A class of implements which appear to have come into use since the Cayapa moved to the river valley are made from calabashes, the gourd-like fruit of a tree grown quite commonly along the river. It is said by the Cayapa that in former times pottery was used largely for the many purposes which the various utensils made from the calabash now serve, for the reason that this tree does not grow in their former mountain home. They say that the particular species of calabash which they now grow and use so extensively is an importation from Colombia, but that there is indigenous to this section another and smaller species. The Cayapa maintain that the Indios Bravos, who formerly inhabited this region, used this indigenous calabash and made receptacles similar to those which they themselves now make.

415 245 As before described, there are now grown two different forms of calabash, the one globose (called wa'iyū), the other ellipsoidal (known as cu'lya). These fruits grow to about the size of a man's head, though sometimes they are considerably larger, and a tree produces a large number in the course of a year.

5 The calabash, for whatever purpose it is intended, is always gathered while green, but it is not at its best until it commences to ripen. On the other hand, if allowed to ripen completely it becomes too hard for use. The globose form is much more used than is the ellipsoidal, since the latter yields usually but one type of utensil: the spoon, of which six or eight are obtained from a single

calabash. Now and then a small cu'lya is cut into halves and used in the manner of the hemispherical calabash dish called in Spanish mate. The globose calabash yields seven types of utensils. Of these the water-calabash (used as a receptacle for storing water), the small trinket calabash, and the cotton-wad calabash (used with the blow-gun), are made from the whole fruit and are therefore globose in form. The mate, the sieve, the dipper, and the skimmer, are each made from half of one of these fruits, and consequently are hemispherical. 415

The spherical calabashes, such as those shown in pl. LXIII and pl. LXV, are called wa'iyū and are used for carrying and storing water. They consist almost invariably of the large, entire, globular fruit, with a small opening made at or near the stem for filling and pouring. Such a calabash sometimes measures a foot or more in diameter, and each of the women and girls of the household has usually two at least in number, which she keeps filled and on the water rack near the fire-box. Even little girls have one or two small calabashes, which they regularly fill and use in connection with the cooking, in which art they learn to assist while very young. This smaller spherical calabash is used as a receptacle for various other articles: those measuring from two to four inches in diameter are used to hold such trinkets as fish-hooks and the like, while the smallest ones, called le'meta, are for containing the red and yellow achote used as face-paint. [868]

When gathered green, calabashes are filled with a mass of fairly hard white seeds and pulp, which are removed

415 with considerable care, especially from the globose water-calabashes (the wa'iyū) which have such small openings. By repeatedly striking the shell of the calabash gently with the point of a machete or other sharp-pointed implement in such manner as to chip the shell away little by little, an opening of the desired diameter is made: this is usually at or near the point at which the stem of the fruit was attached, and its size depends on the size of the calabash, but it rarely exceeds an inch and [413] a half. With a long implement (wai-be'rū, or wai-be'ū; from wa iyū, calabash, and be'rū, hook), such as that shown in pl. cxvii, 1, the seeds and pulp are removed. It has one end shaped like a chisel, the other being fitted with a piece of coconut-shell in the shape of a hoe-blade. The chisel end is first inserted and the mass of pulp cut and worked into as small pieces as possible, a small quantity of water being added from time to time. The greater part of the pulp having been thus removed, the implement is reversed and the inner walls of the calabash are scraped with the hoe-end until they are smooth and clean. This process is usually performed in a canoe at the river where an abundance of water is available. Finally the calabash is turned with the opening downward over a stick, outdoors, until it has thoroughly dried. This curing in the more or less direct sunlight changes the color of the outer surface of the calabash from light-green to dark-brown.

415 531 Calabash receptacles are frequently ornamented with incised lines or figures, or with grotesque figures of mammals, birds, and human beings. A variety of these

designs is shown in pl. LXXXVI. This decoration is 415 accomplished by cutting with the point of a machete or 531 a knife while the calabash is green, and results, when the utensil is dried, in a white linear figure on a brown background, since it is only the thin outer skin of the calabash that turns brown in the curing. After several days of 415 curing in the open, excepting during rain, the calabash vessel is ready for use. It is rarely put into service immediately, however, since a considerable supply of these utensils is always kept on hand; more frequently it is stored away to season thoroughly and become more durable. A small cross-stick attached to a piece of pitigua cord is inserted in the opening of a globose water-calabash, which is then suspended from a rafter of the house to season. Ordinarily several of these calabashes are thus hung in a cluster. The opening is always plugged with a piece of hoja blanca, or of the leaf ũ'tya hakɪ, used in cooking, in order to protect the calabashes from the ravages of cockroaches.

A second type of calabash utensil, called in Spanish mate and in Cayapa ca'lya, is usually hemispherical and is made ordinarily of the globose form of fruit. Now and then, however, an ellipsoidal calabash is used for this purpose, in which case the mate is elliptical in horizontal cross-section. Fig. 13 exhibits a hemispherical mate [285] resting on a typical woven ring, made to keep it in an upright position, especially when used to serve liquid at feasts. About the rim and on the sides of the mate are [531] shown incised decorations. By cutting the fruit exactly in two, through the stem, a single calabash of

415 [412] course provides two mates. The cutting is almost always done with an old machete, the edge of which is serrated by striking it with another machete at intervals of about an eighth of an inch. With this crude saw the shell of the calabash is carefully cut along a line marked usually by a string tied tightly around it. The removal

[285 531]

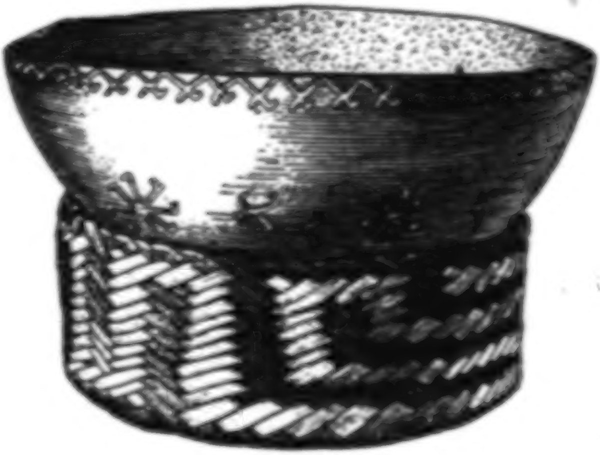

Fig. 13.—Calabash vessel and woven ring

of the pulp is in this case a simple matter. It is first scooped out in large pieces with the point of a machete or a knife, and then, when the inner surface of the shell is reached, it is scraped carefully and smoothly with a small, smooth-edged clam-shell. The drying also is a more simple process than in the case of the water-calabash, since the inner surface is more exposed to the air.

When dry, the mate is used for a multitude of purposes, such as dipping liquids, serving foods, and so on. If permitted to lie for a long time in any liquid, the cala-

bash absorbs the moisture, causing it to soften and 415
ultimately to decay; but if kept in a dry place when not in use, it may be of service indefinitely. Although the walls of one of these calabashes are not more than a sixteenth to an eighth of an inch in thickness, they bear a considerable strain, as when used in bailing canoes.
Inasmuch as canoes are always left over night in the 504
river, they often become more or less filled by rain during the night, consequently the need of calabash bailers is very great. On arising in the morning it is the duty of some member of the family, if the day is fair, to go to the river with a mate and bail out all of the canoes, both those of the members of the household and those of visitors.

The advantages of a mate over a pottery or other 415
heavy vessel are apparent: it is easily made, fairly dur- 501
able, and very light. Its lightness and portability are of special advantage in traveling by canoe, when every pound saved is important; moreover, it will not sink should it be dropped overboard. In fact, advantage is taken of the lightness of the mate in the following interesting manner: Some canoes are very long, and when fully loaded in their center it is impossible for a person in the prow to pass anything, such as food, to one in the stern. Therefore, in event of such need, it is necessary only to place the article in a mate, set the mate in the water, and as the stern of the canoe passes it, it is picked up. To pass any small object, such as a knife, it is usually placed on the blade of one of the long paddles and passed over the cargo. Obviously this could not be done with a round-bottomed mate, especially if it contained liquid.

291 The mate[1] has still another special use—that of a
415 woman's cap. With it is worn a piece of light-weight
black cloth or a double bandana handkerchief, which
passes over the head and shoulders and hangs down the
back as a protection from the sun. Usually this cap is
[531] decorated with incised lines and figures, and occasionally
it is used as a drinking-cup in traveling, but it is never
put to any of the ordinary uses in which common mates
[501 are employed. On long canoe journeys the women
514] usually carry special mates for use as urinals.

415 By means of two small perforations at each of two
opposite points, a hemispherical mate is bound to a long
handle to serve as a dipper, especially in the distillation
of rum. Such dippers, called sūmbū and ūikala pī
cūīnūnt-sū'mī, are shown in pls. LXIII and LXV.

Further, the bottom of a mate may be perforated to adapt it as a sieve or strainer, called cī'culya, in making green-corn mush and ripe plantain gruel. Attached to a long handle, such a strainer is employed for skimming the froth which rises in boiling cane juice preparatory to fermentation.

The third form of calabash implement is the spoon,
called ci'ñ kūtcada, from Spanish cuchara. This
implement is always made by cutting narrow sections
from the side of an ellipsoidal calabash with the saw-
like machete above mentioned. One of these fruits
ordinarily provides material for six to eight spoons, vary-
ing in length from three or four to as much as fifteen
415 inches. The large spoons are commonly used for stirring
177 food while cooking, and both the large and the small

[1] [i.e., a hemispherical gourd container.---Analyst]

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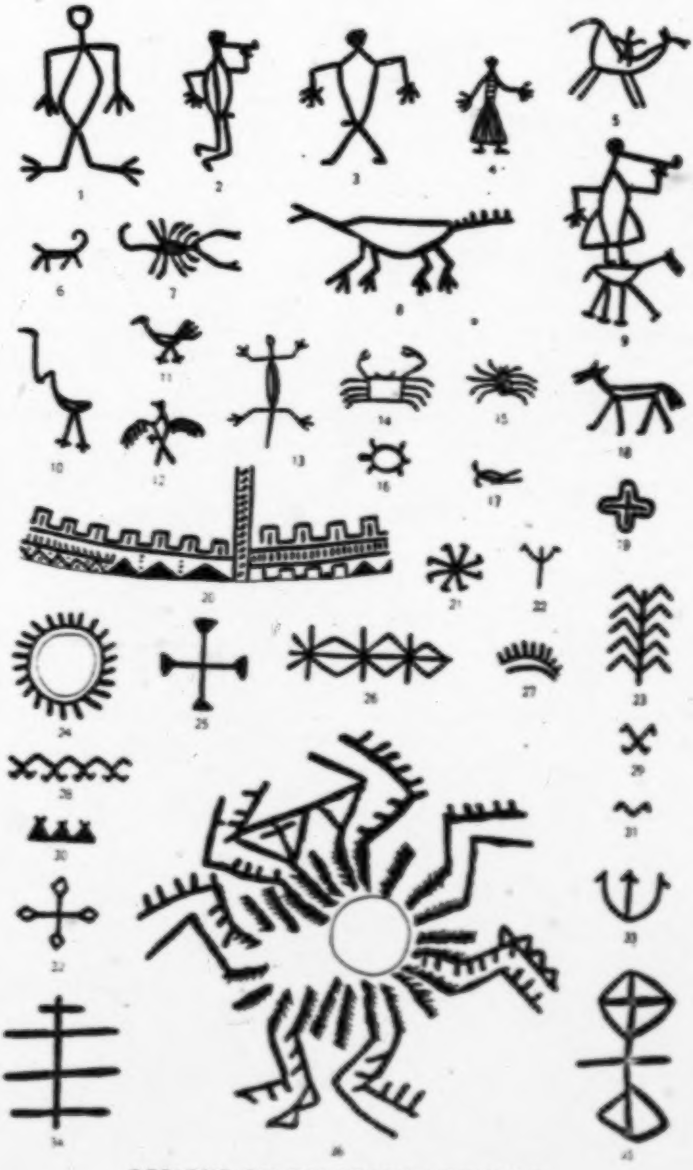
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DESIGNS ON CALABASH UTENSILS

[p. 172 (4)]

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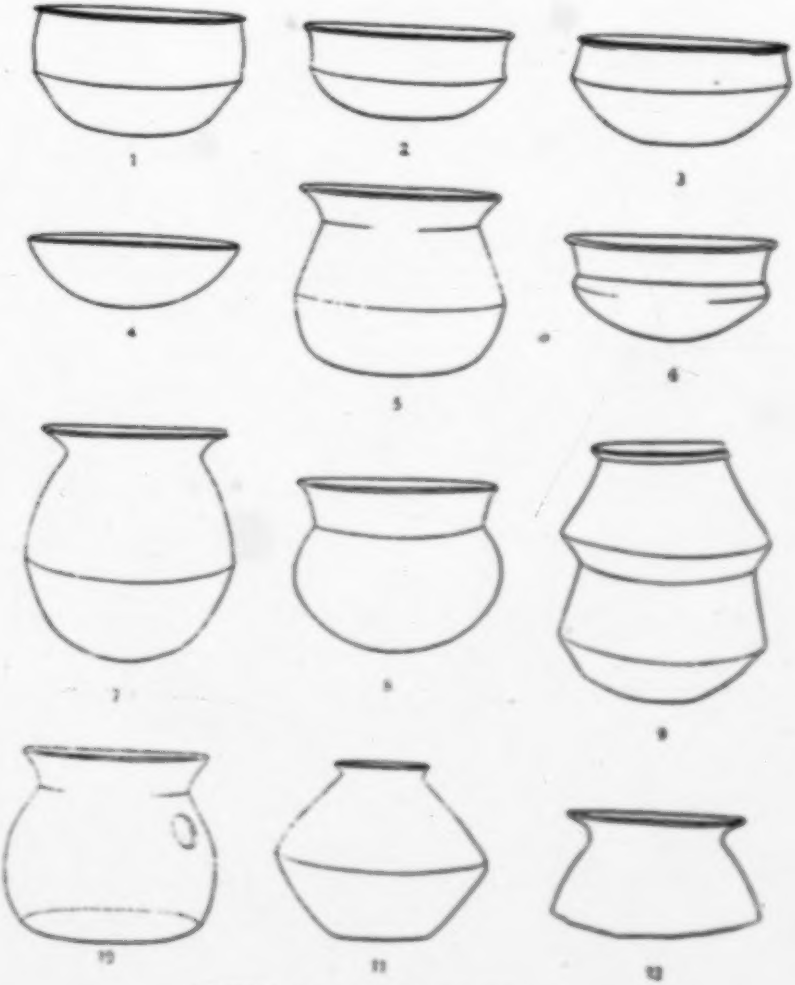
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FORMS OF POTTERY VESSELS

[p. 172 (B)]

ones are used to a certain extent in eating, although for 415 this purpose they have been largely superseded by iron [177] spoons. Calabash spoons, like the mates, are often [53] ornamented with incised lines.

## POTTERY

The Cayapa make a rather crude, heavy pottery vessel, entirely undecorated except in a few forms in which 323 incised lines and dots are impressed in the rim or the shoulder; but no painting, slipping, or glazing is used. The generic name for pottery is pia'ma, or bla'ma.

There are in all ten forms of pots, eight of which are in 323 415 general use among the Cayapa. All are shown in outline in pl. LXXXVII. These types are: 1, A shallow plate form (fig. 4), called specifically tö' palatö. 2, A somewhat deeper cooking-pot (figs. 1–3), the sides of which, under ordinary circumstances, are comparatively straight, while the rim is without a lip. 3, Another cooking-pot (fig. 6), with a more or less hemispherical base, a pronounced shoulder around the side, and a prominent outcurving lip. 4, A small, flat-bottomed pot (fig. 5), somewhat of the form of an inverted truncated cone and with a more or less outcurving lip. 5, A somewhat globose form (fig. 8), with wide neck and outcurving rim. 6, A large storage olla (fig. 11), called specifically bü'lüm blama, with slightly oval bottom, more or less conical sides, and narrow neck with outcurving rim. 7, A large pottery caldron (fig. 7), which forms [274] part of the still. 8, The condensing chamber (fig. 10), without bottom, used in distilling rum. Pots of the

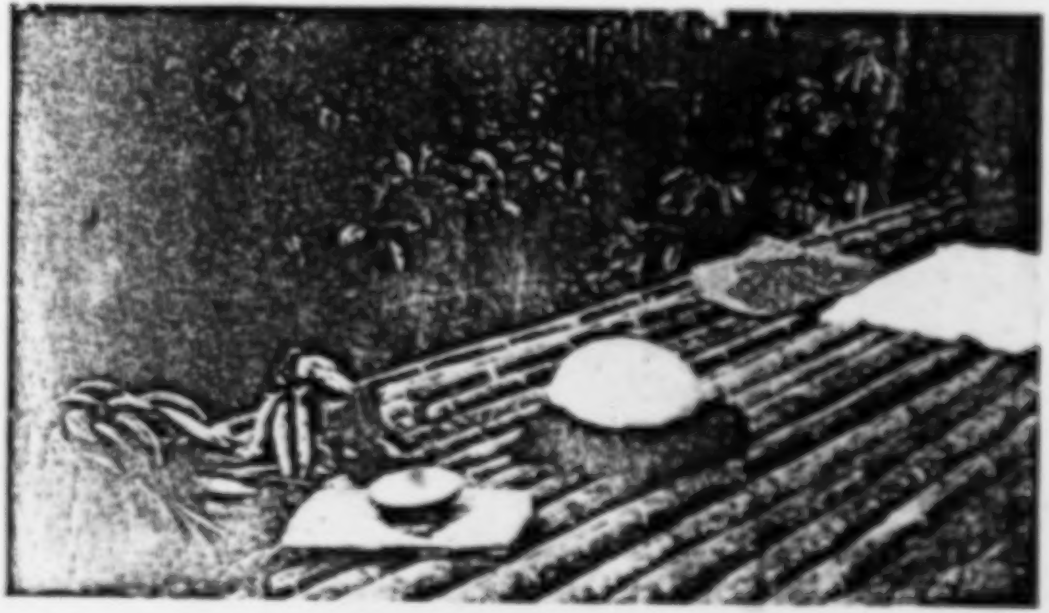
323 forms shown in figs. 1-2, 6, are without special name,
415 being known by the generic term pia'ma. Those of the forms represented in figs. 5, 7, 8, are called kanda'rō.

323 To these earthenware vessels may be added a ninth
352 form, though it can not strictly be considered as a separate type, since it is made by breaking off the lower portion of one of the other forms (fig. 12). It is set over the fire and serves as a kind of chimney to direct the smoke and heat upward to the fish that are laid upon sticks
415 across its mouth for curing. There is also used, though
323 rarely, for making chocolate, a pot with reëntrant sides like that shown in fig. 9.

317 The clay, called tü *or* tü, used in pottery-making is
323 yellowish-brown in color and is dug from the banks of certain esteros. Usually a considerable quantity is gathered at a time and brought by canoe to the house, where it is worked over to remove stones, sticks, and other impurities. It is then wrapped in leaves and put in a shady place until needed, being moistened with water from time to time. For tempering the pottery there is mixed with the clay a bluish, gritty earth, called lu'c tü, meaning literally "blue earth or clay," which also is found in a few places along the river.

323 In making pottery, the woman takes a quantity of cleaned clay and again works it over to remove any remaining foreign substances, water being added if necessary to make it plastic. When the clay is of the proper consistency, the bluish, gritty earth above referred to is thoroughly kneaded into it, in quantity equaling perhaps one-tenth that of the clay. This

[p.174(a)]



POTTERY VESSELS SET TO DRY

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PL. LXXXIX

[p.174(a)]

FIRING POTTERY

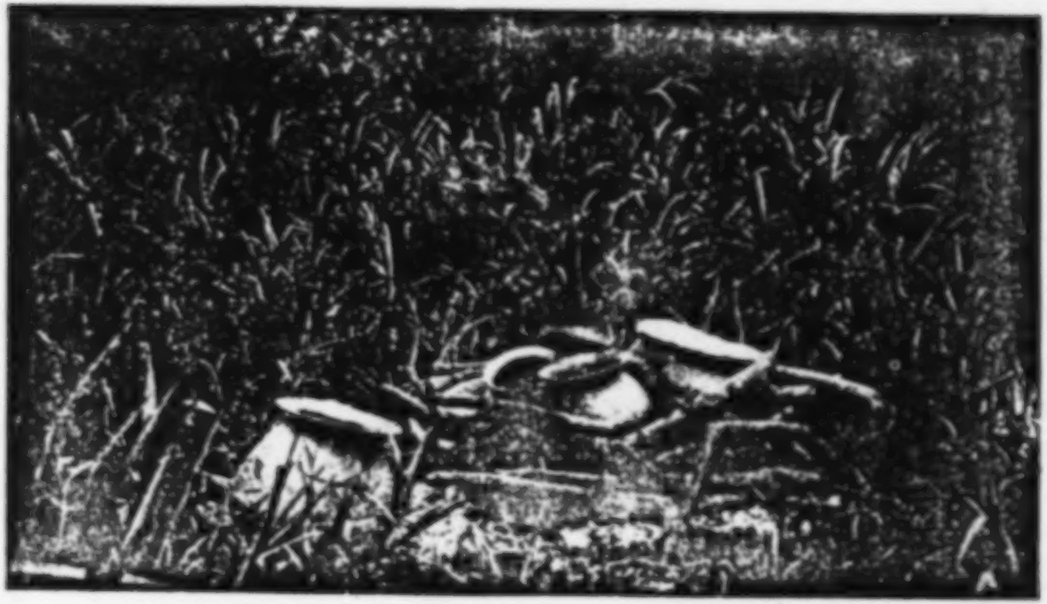
tempering material is called tū ya'ndū. The mixing of a 323
small quantity of clay is a mere matter of rolling and
kneading it in the hands; but if a considerable quantity
is required, as in making a large olla, it is usually mixed
in a large wooden tray such as that shown in pl. LXII, 4.
After thorough kneading, handfuls are torn from the side
of the mass and thrown back violently on top of it. This
process completed, a small lump of the clay is taken, or a
very small, crude pot is made, and immediately baked
in the fire-box in the house as a test.

To make a small plate-form utensil, one about four
inches in diameter, a lump of prepared clay is rolled care-
fully between the hands to form a smooth sphere. The
right thumb is then inserted and the ball of clay is turned
about it in such manner as to make a depression in the
center. Then by constantly pressing between the thumb
and the fingers as the ball is rotated, the depression is
gradually enlarged until finally the bottom and sides of
the pot, of even thickness, are formed. If the vessel is [413]
very small, this work may all be done upon the palm of
the left hand, but if it is of medium or large size, a board,
ten or twelve by fifteen or eighteen inches (pl. LXXXVIII),
or other flat object is used in order that the vessel may
readily be turned. Occasionally the wooden base is 352
elaborately made, as that shown in pl. LXXXIII, 1, which
is circular, has four legs, and resembles in some respects
the wooden benches before described. Its special use,
however, is that of a rest for the larger pieces of pottery,
and it is claimed by the Cayapa that it was rarely or
never used as a seat.

323 The bottom and sides of the small receptacle having been formed, the edge is trimmed and made of uniform thickness by placing the thumb on the inner surface at the edge, the end of the first finger on the edge itself, and the ball of the second finger on its outer surface. By passing the fingers, held in this position, back and forth over a space two or three inches at a time, the edge is gradually reduced to uniform thickness and all unevenness is removed. Places thinner than desired are patched with a small quantity of clay carefully worked in and smoothed like the rest. Should there be a place that is too thick, a pinch of the clay is taken with thumb and finger before the smoothing is commenced. The edge is finally smoothly finished with the inner surface of a small piece of green banana or plantain peel.

[413] There is always a certain roughness on the inner and outer body surfaces of a pot at this stage; this is removed by means of small instruments, called tōmbilya'mba, made usually from sections of broken calabash dishes or spoons, the edges of which are ground on a stone until they are uniform in outline and sharp. The smoothing of both the surfaces and the edge having been completed, the pot is set in the shade to dry and harden. This requires, in the case of a small, thin-walled pot, only a few days, when it is ready for firing. Care is taken not to dry a pot too rapidly, and that it dries uniformly, on account of the danger of cracking due to differential shrinking.

The base of a larger pot is made from a lump or mass of clay in the same manner as that above described, except that the edge is not smoothed so carefully. This



POTTERY AFTER FIRING

[p.172(a)]

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323 base is set in a cool, shady place to dry partially, then the remainder of the pot is built up by the coiling process. A base is shown in the foreground of pl. LXXXVIII, in which an unfinished pot of medium size is seen on the board used as a rest and which enables the potter to turn the vessel about easily and without pressing it out of shape. Such a base is dried, for a length of time depending on its size and the thickness of its walls, until it is hard enough to bear the weight of the first coil upon its edge. A pot six or eight inches in diameter will dry sufficiently in two or three days to permit of the application of the first coil, but a large and correspondingly heavy olla requires several days to dry.

The coils are made by rolling out between the palms of the hands a rope of clay of a length equal to the circumference of the pot and of a thickness, for a pot of medium size, usually not more than a half to three-quarters of an inch, and for a large pot not more than an inch. A groove is made with the ball of the first finger the full length of the coil of clay, which is then placed with the groove downward over the edge of the pot, any surplus being nipped off with the thumb and finger at the point where the ends meet. These two ends are then worked together with the thumb and fingers, and the edges of the groove in the coil are next pressed down upon the edge of the portion of the pot previously completed. While this finished portion of the pot is more or less dry and hard, it is not hardened sufficiently to render it unpliable, hence it is easy to mingle the new clay of the coil with the old clay of the formed portion. The upper part of the coil is now worked out with the thumb and fingers until it is of the same thickness as the lower portion, after which its edge and sides are smoothed as were those of the portion of the pot already completed.

This one coil is usually sufficient to complete a plate-form pot of medium size, but in pots of other forms and sizes the number of coils varies. After the addition of each coil, the pot is set aside to dry somewhat before the next coil is added, since the moist clay is not sufficiently stiff to support a considerable weight.

This method of forming the bottom and lower part of the sides applies only to the small and medium-size pots. In making the bottom of a large pot the following method is employed: An old pot or other object of approximately the size and form desired for the bottom of the pot to be made, is covered with thin leaves or with a piece of cloth in order that the clay may not adhere to the rigid surface. A large lump of clay is then worked out into a thick disc, which is laid on the form and patted and worked in such manner as to cover it uniformly and of the required thickness. While still on the form, it is allowed to dry, since the clay required for this part of such a vessel is of such quantity that it could not stand alone. Such a form with the bottom of a large olla upon it is illustrated in pl. LXXXVIII. The fresh clay is shown here formed upon the cloth-covered bottom of a large cooking-pot, the black cloth appearing below the edge of the clay. *At last*, when the bottom is sufficiently dry, it is removed from the form and its sides and edge are smoothed as above described in speaking of smaller receptacles. Hence-forward the process of building a large pot, coil upon coil, is the same as that employed in making small ones. 323

The largest earthenware receptacles made by the Cayapa are the storage ollas (pl. LXXXVII, 11), used for the fermentation of cane-juice, these vessels being sometimes of a diameter and height of three feet. These large ollas are highly prized, as it is difficult to build up successfully, with the comparatively narrow coils of clay, such large vessels without a flaw in joining the coils. It is also hard to get the clay used in the various coils always of exactly the same consistency, and it is especially difficult to dry the olla properly without checking or other mishap. But the greatest difficulty of all is in the firing; indeed, although a considerable proportion of such large vessels fail in the early stages of their construction, probably ninety percent of those successfully built up and cured, crack in the firing. On the other hand, comparatively little difficulty is experienced in modeling and firing small or medium-size receptacles of varying shapes.

As before stated, the only decoration found on Cayapa pottery consists of small incised dots and lines on the edge of the opening or the shoulder, and even this simple ornamentation is rarely used. The vessel is decorated after being only partly dried. The lines are incised with the sharp-edged calabash instrument used for smoothing the surfaces of the receptacle, while the dots are made by means of the serrated edge of the shell of a small bivalve. The decoration consists almost invariably of a simple row of parallel lines placed vertically or obliquely. Now and then a zigzag is used. 323
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323 After a pot has become fairly dry and hard, its surface receives the final smoothing, and in some cases it is given [824 413] almost a polish. This is done by means of a large discoidal nut, called mûlûmbû mûñge′nû, indigenous to the region. The same nut is used in making tops and also the spinning handles for tops. In pl. LXXXV, 1, 4, it is shown used in these two ways. In smoothing pottery the edge of the nut is wet with saliva and is rubbed back and forth repeatedly over the vessel, thus smoothing the surface and making it more impervious by filling the pores. No slip or paint of any kind is used.

The vessels are now ready for firing. A quantity of wood is gathered and the pots are carried to an open place near the house. Here they are stacked one within another or arranged on the ground in any convenient manner, and a kiln is made by carefully piling wood around and among them. Coals are brought from the fire-box in the house, the pile is ignited, and the fire is carefully watched and more wood added as required. A pottery kiln is shown in pl. LXXXIX, the photograph for which was taken just after the fire was lighted. This firing process requires from twenty minutes to an hour, depending on the number and size of the pots, and the quantity of wood used. As the fire dies down, the pots are left as shown in pl. XC, being now thoroughly fired. The earthenware is generally removed with a pole while still hot, and is tested by tapping gently to detect any possible cracking. If badly cracked the vessels are [356] immediately thrown away, but in the case of large pots that are only slightly cracked, they are often kept and repaired with wax (brea).

If possible some ripe-plantain gruel, called ma'la, is poured into the newly-fired pots, which are returned to the embers where the gruel is soon cooked. This cooking serves to fill the pores of the pottery, rendering it practically impervious. If it is not practicable to boil the gruel immediately, the inner and outer surfaces of the receptacles are later rubbed thoroughly with green plantain for the same purpose. This method, however, is considered inferior to the other. 323

All pottery used for ordinary cooking and serving is completed with the firing and the filling of the pores with plantain. Those pots, however, designed for use in fermenting cane-juice in making rum or for the storage of liquids, rather than for use over the fire, are given a coating of brea, usually inside and out, which renders them impervious. It would be useless to apply the brea to pots that are to be placed over the fire, since it melts at a low temperature and readily ignites. Also, if a pot is not intended for storing liquids, there is no reason why it should be entirely impervious, since all earthenware will hold liquids for a short time without allowing moisture to pass through it to any detrimental extent. 323 415

So far as is known, fired clay serves but one other purpose among the Cayapa, that of making small sinkers, called wengötca'll, for fish-lines. These sinkers are either globose or cylindrical, with perforations through the center, and are fired in the same manner as ordinary pots. A line with its sinker is shown in fig. 9 (page 131). 323 227

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# INDIAN NOTES AND MONOGRAPHS

No. 40

A SERIES OF PUBLICATIONS RELATING TO THE AMERICAN ABORIGINES

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# THE CAYAPA INDIANS OF ECUADOR

BY

S. A. BARRETT

PART II

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NEW YORK
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1925

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# THE CAYAPA INDIANS OF ECUADOR

BY

S. A. BARRETT

## PART II

[p. 182 (c)]
[p. 182 (d) is blank]

# CONTENTS OF PART II

## MANUFACTURES—*Continued*

PAGE

- Textile Arts ........ 183
  - Basketry ........ 184
    - Materials ........ 184
    - Technic ........ 191
      - Wickerwork ........ 192
      - Twilling ........ 197
      - Ka'pū Technic ........ 207
      - Tci'nde Technic ........ 217
      - Dō Technic ........ 223
      - Bandilas Technic ........ 228
    - Forms and Uses ........ 232
    - Basketry Handles ........ 236
  - Burden-bands ........ 238
  - Fans ........ 239
  - Mats ........ 248
  - Spinning ........ 251
  - Weaving ........ 259
  - Cordage and Netting ........ 274
- Decorative Art ........ 285
  - Soft Textile Designs ........ 289
    - Table of Manta Design Names ........ 293
    - Glossary of Manta Design Names ........ 307
- Government ........ 312
- Birth ........ 317
- Names ........ 318
- Puberty ........ 320
- Marriage ........ 321
- Death ........ 330
- Kinship ........ 334
  - Ascending Relationship ........ 334
  - Collateral Relationship ........ 335
  - Descending Relationship ........ 336
  - Relationship through Marriage ........ 336

# CAYAPA INDIANS

PAGE
- Composition of Terms ..... 337
  - Qualifying Terms ..... 337
  - Modifying Concepts ..... 340
- Medicine Practices. Shamanism ..... 344
- Religion ..... 352
  - The Universe ..... 352
  - Creation ..... 355
  - The Soul ..... 357
  - Spirits ..... 360
    - Thunder ..... 360
    - Lightning ..... 362
    - Cave Spirits ..... 363
    - Indios Bravos ..... 369
    - The Giant Aslaû'hmû ..... 371
    - Ura''tû ..... 372
    - Kû'me ..... 373
    - Pi''tcûlya ..... 374
    - Paiû û'hmû ..... 375
    - Pehûrû pû'tyû ..... 376
    - Pa'ta'mbele ..... 376
    - Peje Bravo ..... 377
    - Pi pi'ni ..... 379
    - Invisible Treasure ..... 381
- Mythology ..... 381
- Ceremonial Observances ..... 383
  - La Fiesta de Semana Santa ..... 384
  - La Fiesta de Noche Buena ..... 394
  - La Fiesta de Agosto ..... 395
  - Boda ..... 397
- Physical Anthropology ..... 406
  - General Characteristics ..... 408
  - Measurements ..... 416
- Numeral System ..... 448
- A System of Mnemonic Writing ..... 457
- Index ..... 464

[p. 182(F)]

**3: Barrett E-5 (1908-1909)1925**
**SD 6 Cayapa SD6**

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# ILLUSTRATIONS

## PLATES

FACING PAGE

XCI. Rope coils and brushes ........ 186
XCII. Baskets of pitigua and chapil ........ 187
XCIII. Light baskets ........ 190
XCIV. Basketry technics ........ 191
XCV. Basketry technics ........ 192
XCVI. Elements of a design in twilled basketry ........ 193
XCVII. Border finish of a twilled basket ........ 204
XCVIII. Border finish of a twilled basket ........ 205
XCIX. Border finish of a twilled basket ........ 206
C. Border finish of a twilled basket ........ 207
CI. Border finish showing return of diagonal elements and wrapping ........ 216
CII. Tci'nde border with elements returned below ........ 217
CIII. Handles of baskets and fans, and burden-bands ........ 236
CIV. Fans ........ 237
CV. Mat and fan designs ........ 246
CVI. Mats and bark cloth ........ 247
CVII. Girdles, fillet, and spinning materials ........ 252
CVIII. Spinning and winding cotton thread ........ 253
CIX. Loom ........ 260
CX. Diagram of loom ........ 261
CXI. Woven fabric being stretched ........ 266
CXII. Manta or skirt ........ 267
CXIII. Detail of manta pattern ........ 268
CXIV. Manta or skirt ........ 270
CXV. Detail of manta pattern ........ 272
CXVI. Mochos or trunks ........ 274
CXVII. Scrapers, torch, lance, and hook ........ 275
CXVIII. Pita fibers, plies, and cords ........ 278
CXIX. Trot-line, bundle of pita fibers, and cordage ........ 279
CXX. Fishing nets ........ 284
CXXI. Carved face-painting sticks ........ 285
CXXII. Carved face-painting sticks ........ 288
CXXIII. Cloth designs: Human and mammal figures ........ 290
CXXI. Cloth designs: Mammal, bird, and insect figures ........ 296

[p. 172 (a)]

**3: Barrett E-5 (1908-1909)1925**
**SD6 Cayapa SD6**

# CAYAPA INDIANS

FACING PAGE

CXXV. Cloth designs: Mammal groups and geometric figures........ 297
CXXVI. Cloth designs: Geometric figures........ 302
CXXVII. Cloth designs: Geometric figures........ 303
CXXVIII. Musical instruments........ 326
CXXIX. Kinship chart........ 336
CXXX. Settlements of whites and negroes along the Rio Cayapas........ 354
CXXXI. Hacienda of a negro in a grove of cocoanut palms........ 355
CXXXII. Easter festival, Punta Venado........ 386
CXXXIII. Firing "salvos" in the plaza........ 387
CXXXIV. Music in a rancho........ 388
CXXXV. Procession circling the plaza........ 389
CXXXVI. Pantomime of the angel descending to the tomb........ 390
CXXXVII. Procession reëntering the church........ 391
CXXXVIII. Castigator with cat-o'-nine-tails........ 392
CXXXIX. The ceremonial whipping........ 393
XL. Cholo boys........ 414
CXLI. Cholo girls........ 416
CXLII. Young man of the Cholo tribe........ 417

## FIGURES

14. Splitting pitigua for basketry........ 197
15. Twilled trinket basket........ 200
16. Twilled trinket basket........ 200
17. Twilled trinket basket........ 201
18. A unit of ka'pä technic........ 210
19. Component parts of a unit of ka'pä technic........ 211
20. *Pentagonal opening at one corner of bottom of a* basket of ka'pä technic........ 213
21. Detail of tci'nde technic........ 218
22. Component parts of dä technic........ 224
23. Initial unit at the bottom of a basket of dä technic........ 224
24. Details of lan technic........ 245
25. Pita fibers tied to prevent tangling........ 277
26. Mesh-sticks or gauges for weaving nets........ 281
27. Net weaving and detail of knot........ 282
28. Technic of cording on cat-o'-nine-tails........ 393
29. Mnemonic characters........ 430

[p. 182(a)]

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# THE CAYAPA INDIANS OF ECUADOR

### By S. A. Barrett

## MANUFACTURES—*Continued*

### Textile Arts

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29

THE Cayapa weave many useful articles from the native materials that abound in their territory. These objects comprise various types of basketry, one type each of fan, mat, cloth, and three of nets. Their finest textile work is the cloth woven from cotton and wool in elaborate patterns. The only other decorated textiles are fans, mats, and a few types of baskets. This class of decoration is due largely to the materials and to the technic of the articles manufactured, all of which are made from strips of the bark of one or another of five endogenous plants. These strips have different natural colors on their two surfaces, and by bringing their light or their dark sides uppermost, simple geometric patterns alone are worked out without further coloring. Such technic makes possible only a limited number of patterns, as has been pointed out by Dr. Max Schmidt.[14]

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[14] *Indianerstudien in Zentralbrasilien*, Berlin, 1905. Besondere Geflechtsart der Indianer im Ucayaligebeit, *Archiv für Anthropologie*, n. f., vi, H. 4, 270–281. Braunschweig, 1907.

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## BASKETRY

285 Cayapa basketry may be classified according to the materials from which it is made, its technic, and its forms and uses.

Classification according to materials is recognized by the Cayapa themselves, as is shown by the following terms:

### Materials

285 Pitigua = te'tcũa (the root of an aerophitic plant); te'tcũm pickalyĭ = basket made of te'tcũa.
224 Rampile = pi'tcũa (a species of palm); pi'tcũm pickalyĭ = basket made of rampile.
Hoja blanca = fi'ba hakĭ; fi'bañ pickalyĭ = basket made of hoja blanca.
Hoja negra = e'lũñ hakĭ; e'lũñ pickalyĭ = basket made of hoja negra.
Chocolatilla = tcũkũla'te; tcũkũla'te pickalyĭ = basket made of chocolatilla.
Crinande = viñga'tci; viñga' pickalyĭ = basket made of crinande.
Hoja de chapil = kũla'hakĭ; dic-pũnũntsũ'mĭ; kũla' pickalyĭ, kũla'põ pickalyĭ = basket made of hoja de chapil.

The word picka'lyĭ, which strictly signifies any kind of basket other than the burden-basket or the hamper-shape basket, is here used as a general term meaning baskets of all kinds. All considerations of technic, form, and use are omitted in the above classification, material only being taken into account.

The basket materials used by the Cayapa may be divided into three classes. First, the heavy strips or splints of the inner fibers of the aerial root called pitigua, used for making the more durable baskets such as those shown in pl. XCII, 1, 3, 4, 6–8, and in pl. XCIII, 1, 3, 4, 12.

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In the second class of material may be included the thin bark of five species of endogenous plants: rampile, hoja blanca, hoja negra, chocolatilla, and crinande, which are used for making the lighter and less durable baskets, especially the hamper-shape baskets such as those shown in pl. xciii, 2, 5, 6, 10, 11, as well as diminutive trinket baskets like those in figs. 15-17 (pp. 200-201). These materials, especially rampile, are used also in making baskets of other forms, but requiring no great durability or strength. Baskets of this class are shown in figs. 7-9 of pl. xciii. Rampile is also extensively employed in making fans and mats. In the third class of materials is the leaf of the palm known in Spanish as chapil, sometimes also called milpeso, and, by the Cayapa, kīla'pä. Two forms of basket, one conical, the other square-sided (pl. xcii, 2, 5 respectively), are made of this material. Such baskets are suitable only for temporary use, since after a day or two the material becomes dry and brittle; while green, however, it is pliable and fairly strong. The conical basket (fig. 2) serves a ceremonial as well as a utilitarian purpose, being employed by shamans in their medicine practices. 285 824

The most important of the various basketry materials is the pitigua. This durable fiber is derived from the long roots of a single species of aerophitic plant which usually grows in the upper branches of trees and sends its long, slender roots to the ground. Pitigua is much sought for various purposes by the negroes and whites of the region, as well as by the Indians, so that along the lower course of the Rio Cayapas it has become somewhat scarce. When the plant is found, however, its roots are 283 285 824

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SD6 Cayapa SD6

252 easily gathered, since by simply pulling on them they
253 usually break off at or near the plant itself, and often a
255 root seventy-five or even a hundred feet in length is
526 obtained. It is employed not only for basket-making
but for many other purposes, such as for binding to-
624 gether the parts of a house-frame (figs. 3-5), for binding
253 the palm-leaf thatch upon the roof (pl. VIII), and indeed
259 wherever material for tying or binding is needed. It
serves also the many purposes for which civilized people
use string and rope, as for mooring canoes, securing
animals, etc. Pitigua fiber is practically indestructible
so far as dampness is concerned, and may even be kept
wet for a considerable time without rotting. If kept
from direct contact with water, however, it will last for
years even in this humid climate, as is shown by the
bindings on the frames of some of the Cayapa houses that
have been in use for ten or fifteen years at least.

263 When gathered these roots are usually made up into
265 large coils (pl. XCI, 4) and laid away in a dry place until
needed. To render them pliable they are soaked over
night in the river. In two forms of baskets the warp
elements are made of the smaller whole roots of the
pitigua, otherwise the material is always split into strips
or splints, which are prepared as follows:

265 The bark of the root being first removed, its inner
woody portion is split into long, thin ribbons. The
individual fibers of the root are extremely long and
straight, hence when once started a ribbon can be split
the full length of the root with almost perfect evenness.
Usually one end of the root is taken up and split with a
knife or machete, for a distance of an inch or two, into

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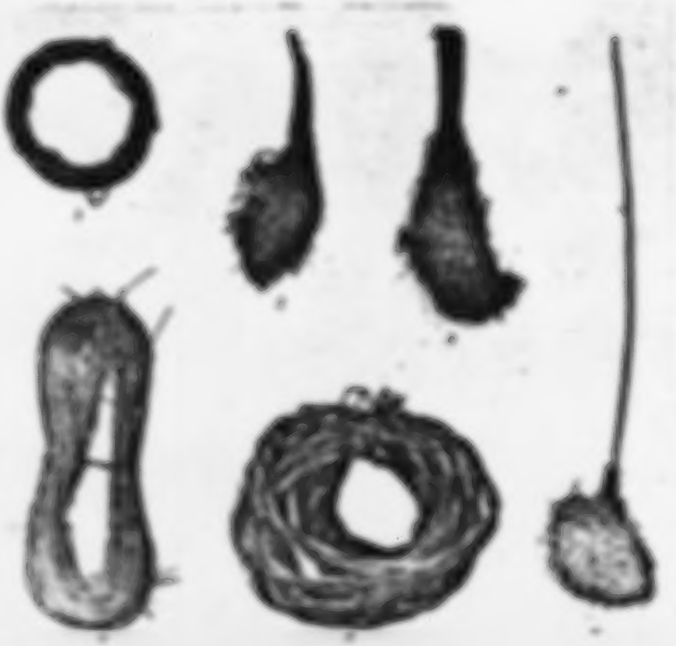

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ROPE COILS AND BRUSHES

[p. 156 (A)]

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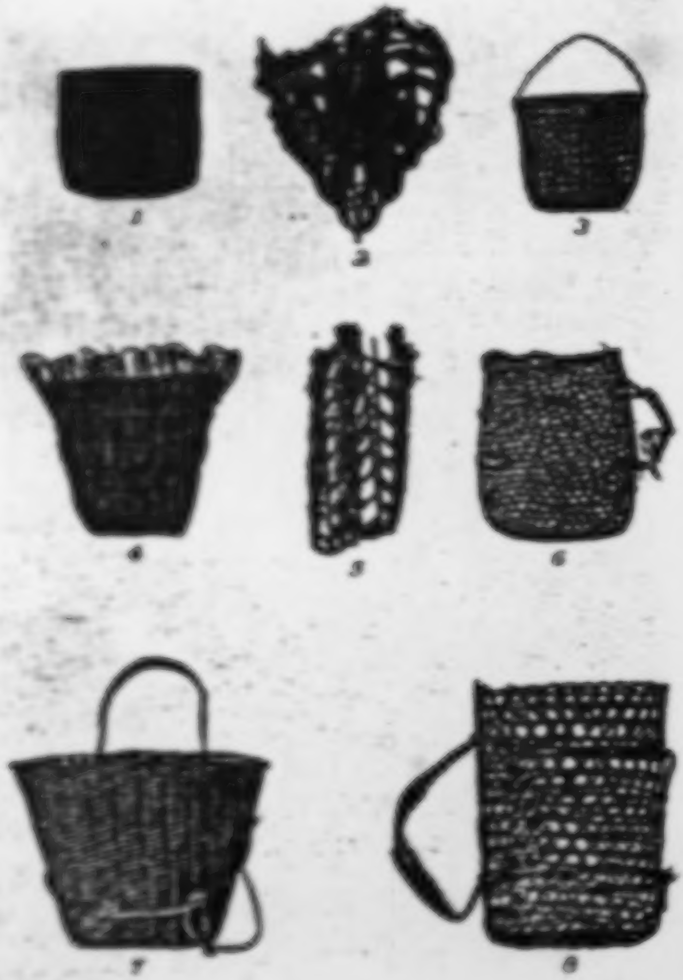

BASKETS OF PITIGUA AND CHAPIL

[p. 186(a)]

as many strips as it will yield. This split end is then grasped with the left hand at a point five or six inches from the cuts described, and is bent with the right hand down over the thumb of the left, or in the opposite direction over the fingers (fig. 14). This tension on the fibers causes them to cleave uniformly along the planes started by the preliminary splitting. A new hold is then taken farther down and the bending repeated, which results in the splitting of another section. In this manner it is possible to split rapidly a long root throughout its length. A root will sometimes yield as many as half a dozen strips suitable for basket-making. Before these are used, however, any rough or uneven places, due to chance cleavage of the fibers along these planes, are removed by scraping and sizing. The scraping is done by holding vertically to the ribbon [412] a knife or other sharp-edged instrument while the ribbon is drawn over the edge of the heel or across the side of the knee. Obviously the width of such strips varies according to the part of the root from which they come. On the other hand, the root differs so slightly in diameter throughout that the variation in the width of a strip is very slight. For the finer basketry all splints are

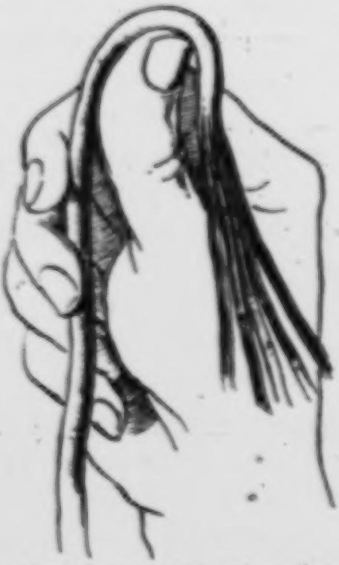

FIG. 14 —Splitting pitigua for basketry

285 trimmed to approximately equal widths, but for ordinary baskets this is not deemed necessary.

222 In case the pitigua root is not available, there are other
285 parasitic plants which send aerial roots to the ground
824 that may be used for temporary baskets.

Of the less durable and lighter materials used for making hamper-shape baskets, the most important is rampile, which comes from the bark of the petiole of a fan-leaf palm which produces thin strips from one-eighth to one-half inch in width and from three to twelve feet in length. In splitting off this bark, the circumference of the end of the stem is cut with a sharp instrument into as many segments as the desired width of the strips demands. Usually the strips on several stems are started at one time and then the bark of each is split off by pulling with the fingers one strip after another. In splitting the bark in this manner, a certain amount of the inner succulent fiber of the stem is taken with it. To remove this a number of strips, perhaps twenty, are grasped between the great and second toe in such manner that one end of the bunch of strips reaches almost to the body. Thus held, the strips are taken in turn and the succulent portions cut transversely at a point a couple of inches from the end. The strips are now taken rapidly one by one and the bark is peeled from the succulent fibers. It remains only to size the strips, that is, to bring them to an even width. This is done by splitting, since in this material, as in the pitigua, the fibers are long and straight, so that when once started they part evenly the full length of the strip. It is rarely necessary to do any special cutting and trimming to make these strips of proper widths.

222 285 824 The material of this class next in importance to the rampile is that obtained from the petiole of the hoja blanca, called by the Cayapa fi'ba hakĩ, signifying, as does the Spanish term, "white leaf." This plant has a long pinnate leaf somewhat similar to that of the banana, but with a long, round, slender, and fairly hard petiole. It derives its name from the fact that the under-surface of the leaf-blade has a thick coating of white bloom. The strips of this material used in basket-making are obtained from the petiole of the leaf in the same manner as are those of the rampile, except that before splitting off the bark it is scraped. This removes a thin, succulent outer coat of light-green, and leaves the inner creamy-white bark which is hard and tough, though very thin. This hoja blanca bark is used chiefly for making small hamper-shape baskets (figs. 15-17) used as receptacles for trinkets, though it is frequently employed in making fans, especially the finer ones. It is much less durable than is the rampile, and for that reason, as also on account of its thinness, it is not adapted to the manufacture of large hampers or of mats.

356 501 824 The blades of the leaves of hoja blanca find a variety of uses, chief among which is as a covering for cargoes of canoes to protect them against rain. The leaves are much tougher than are those of most plants of a similar kind in this region and shed water perfectly. They are used even for repairing leaks in house-thatch, though they are never employed for entirely thatching a permanent building.

285 386 Hoja blanca is the only basket material which is ever artificially colored. The strips are stained with red

285 386 achote, the plant which produces the red face-paint used by the Cayapa. This coloring matter is rubbed on the stem after it has been scraped down to the hard white layer of the bark and before the bark is stripped from the stem. The colored strips are used occasionally as a means of producing the geometric designs used in small hamper-shape baskets and in fans.

285 224 Three other plants with a habit of growth similar to that of the hoja blanca occasionally furnish materials for the hamper-shape baskets. They are the chocolatilla, called by the Cayapa tcö*k*öla'*te*, which yields a brown material; the hoja negra, called e'lüñ haki; and the crinande, called viñga'tci. The material in each of these plants comes from the petioles of the leaves. They are obtained and manipulated in the same manner as is that derived from the hoja blanca. None of the three, however, is ever colored.

285 482 [222] As above mentioned, the leaf of a large species of palm, called in Spanish chapil, is used on rare occasions for basket-making. Should a person be out hunting, or for any other reason be at a considerable distance from his house and unexpectedly find some fruit or other commodity which he cares to take home, he may, by securing a couple of the large leaves of the chapil, quickly fashion a temporary burden-basket, such as either of those shown in pl. XCII, 2, 5, in which to carry them. Such a basket is never kept for further use, for as soon as the leaves become dry they are very brittle and entirely worthless.

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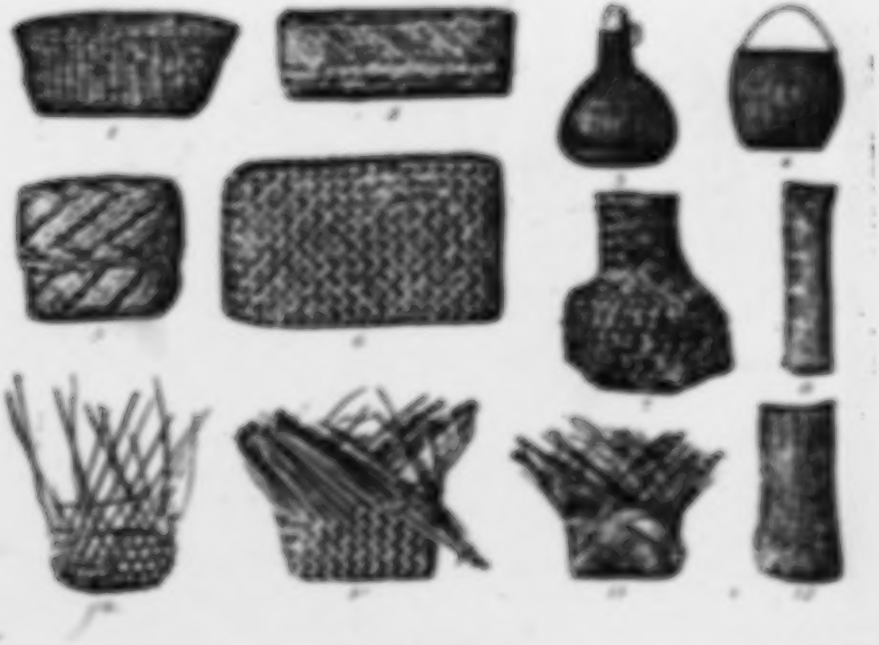
[p.190(a)]



LIGHT BASKETS

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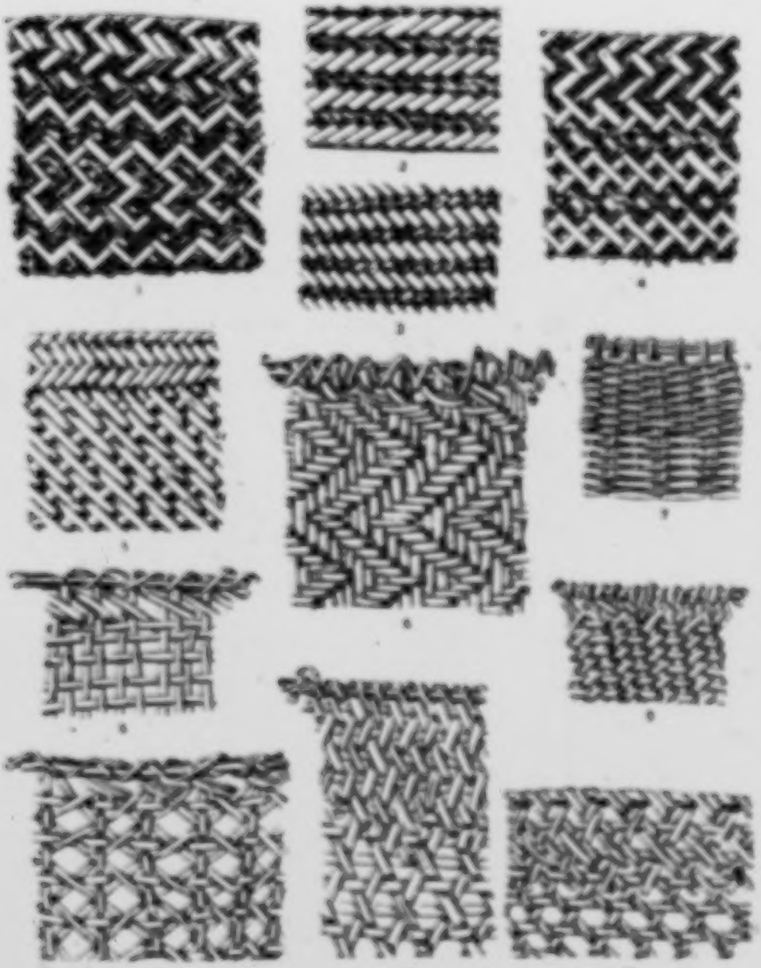

BASKETRY TECHNICS

[p. 190(B)]

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### TECHNIC

From the standpoint of technic, Cayapa basketry may be divided into three general classes according to the number of elements used in the construction, as follows: 285

*Two-element work:*
  Wickerwork—kŭtse'ka (pl. xcii, 4, 7; xciii, 1, 3, 4, 12; xciv, 7; xcv, 1, 2, 5).
  Twilling—kapē'a, yē'l or ya'iyi (pl. xciii, 2, 5, 6, 8, 10, 11; xciv, 1–6; xcv, 3, 7).
*Three-element work:*
  ka'pē (pl. xciv, 6, 8, 12).
  tci'nde (pl. xciv, 11; xcv, 4, 8, 10, 12–14).
  dō (pl. xcv, 6, 16).
*Four-element work:*
  ba'ndilas (pl. xcii, 3; xciv, 10; xcv, 9, 11).

In addition to these technics, which may be considered the regular Cayapa basketry technics, there are two others used in the two types of palm-leaf basketry made by the Cayapa and illustrated in pl. xcii, 2, 5. In the first instance the technic bears a resemblance to checkerwork, while in the second it is based on the same kind of manipulation which in cordage is known as the "half-hitch."

Neither twining nor coiling is used, and the same may almost be said of checkerwork, although there is one form of basket, the bottle-shape bait basket (pl. xciii, 3), which has on its bottom a technic somewhat resembling checker (pl. xcv, 2). In this case several splints are used to form a wide unit element, and it cannot be strictly called checkerwork, but is rather wickerwork in which several splints instead of one are employed as a unit. In some specimens the resemblance to checker-

285 work is still more apparent than in the one here referred to, because these composite, wide elements are made to pass under and over one another several times instead of only once. This process is never employed except at the starting point of this form of basket.

In detail the technics employed by the Cayapa in their [293 352] 482 basketry are as described below. Further, in addition to its use in basketry, twilling is employed in making mats and fans, and wicker is used in certain burden-bands and in fan-handles.

### WICKERWORK

285 415 482 Wickerwork, the simplest of the two-element technics, consists of the passing of a single active or woof element over and under successive passive or warp elements. The Cayapa employ this technic almost solely in connection with the material derived from the aerial root called pitigua and for the making of five forms of basketry: a burden-basket, a shallow rectangular basket, a bottle-shape bait basket, a more or less globose basket used in carrying fruits and as a general household utensil, and a long tubular basket used especially as a receptacle for spindles. Examples of burden-baskets are shown in pl. XCII, 4, 7, while the other forms are illustrated respectively in pl. XCIII, 1, 3, 4, 12.

Ordinarily the Cayapa wickerwork is comparatively tightly woven, as is shown in illustrations referred to. There are, however, two special types of wicker basket [251] which are open in their technic. Both are made for the purpose of allowing water to pass readily through them, being used especially as cages for live crayfish which are

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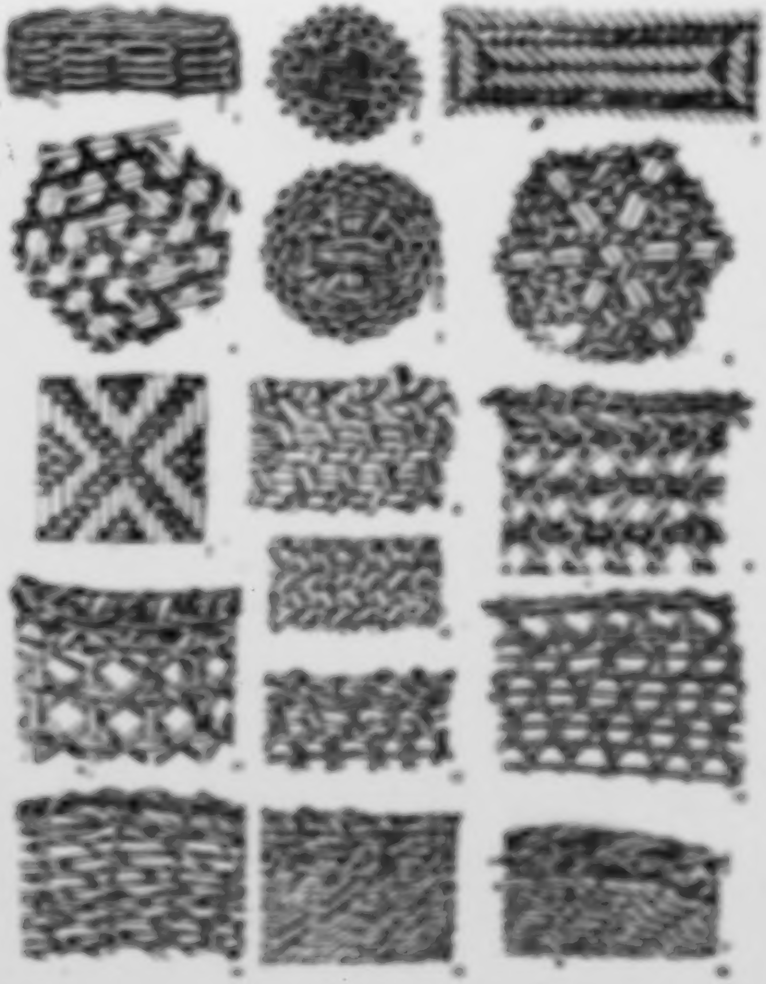

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BASKETRY TECHNIQUE

[p.192(a)]

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SD6 Cayapa SD6

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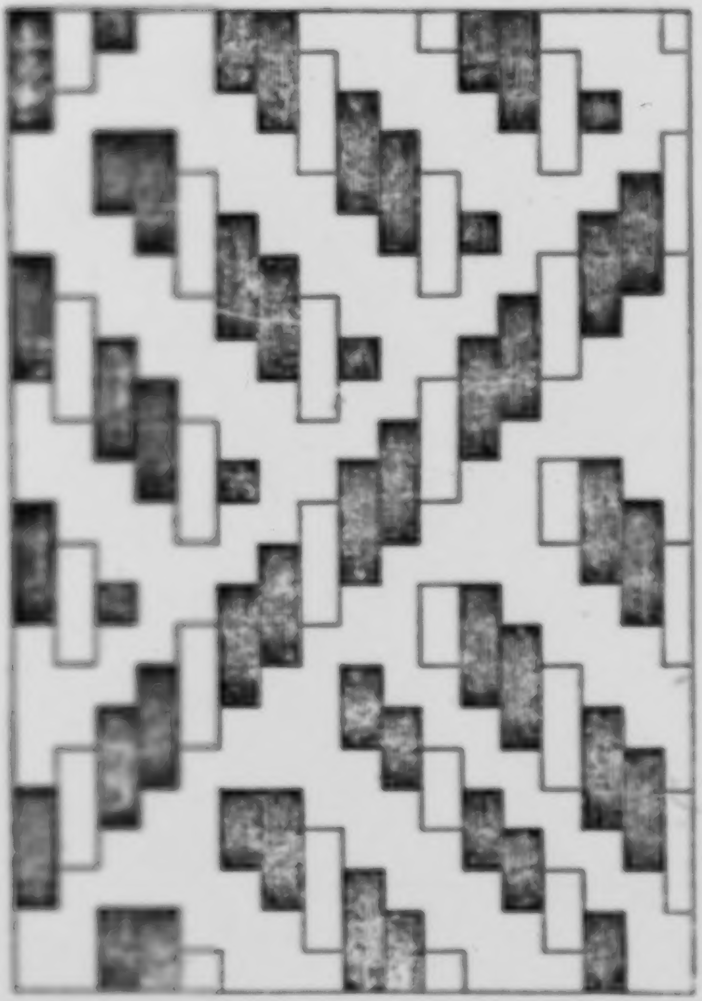

[[illegible] overlay on p.192(8)]

285 thus kept in the river until required for food. Both of these open types are similar in form to that shown in pl. XCIII, 4, and one of them has tightly woven sides identical to those of the basket shown in this figure, but has what may be termed an open-work wicker bottom. The other has open-work sides as well as bottom. A portion of one of these sides near its upper edge is shown in pl. XCIV, 8. This openness is produced by the simple device of spreading the elements apart so as to leave openings or meshes of the desired dimensions. In the one with the open-work flat bottom only, these openings or meshes are produced by the omission from this portion of the basket of the long, continuous active element which goes back and forth in the ordinary tightly woven wicker basket alternating with the shorter active elements which are later turned up to form the sides of the basket.

The rectangular bottom of the tightly woven wicker basket deserves special attention on account of the particular technic involved. In making such a rectangular base, the details of which are shown in pl. XCV, 1, several parallel splints are first laid down to form the warp elements. One end of a very long woof element is next passed over and under alternate ones of these. A second and very much shorter woof splint is next placed parallel to the first and is so inserted as to pass over and under the warp splints in an order the reverse of that of the first woof splint. The point at which this second woof splint crosses the last of the warp elements at one edge forms the turning point for the first woof splint. This is turned directly back in a kind of loop and is passed parallel to itself but in the opposite direction, and over and under the elements of the warp. It crosses these in the same order which it first took and in the reverse order to that in which the second woof element crossed them. Thus, up to this point, the original set of parallel warp elements has been crossed three times, twice by this long, continuous element, and once by an ordinary, short woof element which later turns up at its two ends to form part of the sides of the basket. This long, continuous woof element having now reached the side of the basket from which it started, a second short element is inserted. This element, which makes the fourth woof to cross the warp elements, is manipulated in exactly the same manner as was the second. The long, continuous woof element again reverses its direction by means of a turn about the end of the second short element just mentioned and passes back, in the same manner as before, in and out among the warp elements and, reaching the opposite side of the set, again reverses its direction and again passes back to the opposite side of the basket, there being of course previously inserted a third short woof element. Thus, by means of this long, continuous splint which passes back and forth in serpentine fashion across the bottom of the basket in such manner as to include between the sides of each loop an ordinary short woof element which later turns up to form the sides of the basket, a rectangular bottom is produced. The lengths of the sides of this rectangle are governed by the size of the basket desired, but in every case the rectangle is longest in the direction in which the continuous woof splint is running.

By the nature of this technic the spacing of the warp elements on a long side of the basket is much wider than that on a short side or end, and it would appear that in this fact lies perhaps an explanation for the use of the long, continuous, serpentine woof element. If all the woof elements were short ones whose ends turned up to form warp elements at the ends of the basket, the number of these warp elements would be far too great for practical use. By the insertion, on the other hand, of this continuous woof element, the number of these warp elements is reduced by half and the spaces between adjacent warp elements increased sufficiently to permit the woof elements on the sides of the basket to pass in and out among them with ease. As it is, the warp elements on the ends of the basket are considerably closer together than are those on the sides, so that the number of these elements at each end of the basket is somewhat greater than that at each side, although the sides are considerably longer than the ends.

In all baskets made in this technic, except the one with the open-work sides as well as bottom, the borders are finished by a simple looping over of the warp elements, as shown in pl. xciv, 7. The method of manufacture of a Cayapa wicker burden-basket, and especially the method of finishing the border, is shown in pl. xcii, 4. Such a basket is made over another burden-basket as a foundation and to give it its correct size and form. As the basket nears completion, each warp element, which until now has projected upward, is bent over, sometimes inward and sometimes outward, and brought down along itself and caught by the woof elements as they pass in and out among the warp. This produces a series of large

285 loops which project upward and replace the simple warp elements. These loops now become the warp elements, and each is used as a unit in the weaving which proceeds as before until the extreme edge is reached. Here from one to three rounds of pitigua, usually unsplit, are passed through the loops themselves and around the whole opening of the basket. The loops up to this point are quite large and project loosely above the woven portion of the basket, as shown in pl. xciii, b. Also the extreme ends of the splints project downward at the sides of the basket. Now, by pulling these projecting ends downward, the slack in the loops is removed and the inserted pitigua drawn firmly down upon the edge of the woven portion of the basket, thus producing a smooth and even edge or border. Nothing remains, then, to complete the basket except to cut off the loose ends of the warp elements which project from the sides of the basket. The length along which each of these warp elements is returned down through the side of the basket to make this binding varies greatly and may be as great as half the height of the basket, as is the case in the large burden-basket shown in pl. xciii, f. On the other hand, it is rarely less than equal to the width of eight or ten of the woof elements, thus in any case giving a good firm border.

The only other type of border found in wicker basketry is that shown in pl. xciv, b, which was found in only one instance—a very open-meshed basket made of pambile. In this type the projecting warp elements are taken in pairs and each pair is bent inward over a transverse splint placed along the inside, then passed diagonally

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SD 6 Cayapa SD6

downward, then outward to a position in front of the next pair of warp elements, and finally inward and behind the next pair of these elements. Along the outer surface and directly opposite the above-mentioned horizontal splint, another is passed, and these two are secured by two splints passing spirally and in the same direction along the entire border in such manner as to fasten firmly the pairs of turned-down warp elements. 285

As above mentioned, the wicker technic finds slight use outside of basketry. It is employed in weaving the broad head-bands of the burden-straps which are made of pitigua or of the fibers from the leaf of the palma real, and occasionally in weaving the outer surface of the handle of a fan. In the one first mentioned the elements employed are fairly broad strips of pitigua, as shown in pl. CIII, 1. In the second, the warp elements are made by placing from four to six of the small cylindrical palma-real fibers side by side to form a broad and fairly rigid element. The woof element consists sometimes of but a single palma-real fiber, but usually of two placed side by side as shown in pl. CIII, 3. Occasionally more than two of these fibers are used in such a woof element. The surfaces of fan handles are almost always made, like the blades, in twilled technic, but occasionally one is found which is in wicker, as in the example shown in pl. CIII, 5. 285 293 [482]

TWILLING

The second technic consisting of two elements is twilling. This is employed in the making of hamper-shape baskets (pl. XCIII, 2, 3, 6, 10, 11), long, tubular 285 415

[415] 285 [352] baskets (pl. xciii, 8), used as receptacles for spindles; mats (pl. cvi, 1, 2); fans (pl. civ); and rings used as rests for calabashes (fig. 13). In all of these the material used is the bark of the fan-leaf palm, locally called pambil. But one type of basket has been encountered in which this technic is found in combination with another material: this is a square-bottomed, cylindrical basket similar in form to that shown in pl. xcii, 3, and is made of pitigua. A section of the side and border of this basket is shown in pl. xciv, 6.

285 The manipulation of the elements in twilling varies considerably in Cayapa basketry. There are three fundamental methods of handling these elements, as follows: (1) A method by which one element passes over two and under two of the elements which run in the opposite direction (pl. xciv, 3); (2) a method by which it passes in a similar manner over three and under three (pl. xciii, 6, 10); (3) a method in which an element passes over seven and under one (pl. xciii, 2, 5, 8, 11; and pl. xciv, 5). [177] The last form is said to have been introduced among the Cayapa by the Indians of Colombia, and in substantiation of this it may be noted that the few Cholo who now live on the Rio Cayapas use this form of twilling extensively. The two simpler forms of twilling, so far as could be ascertained, have been long in use among the Cayapa.

In case no design is attempted, as in the basket shown in pl. xciii, 11, or a simple design be desired, as in the baskets shown in the same plate, 6, 10, and pl. xciv, 2, 3, these fundamental methods of handling the elements are not varied throughout the basket. If, on the other hand, comparatively intricate patterns are attempted, 255 these methods of handling the elements may vary greatly and appear to be governed solely by the desire of the maker to produce such combinations as will bring to the surface elements of the desired colors in the necessary sequences.

In pl. xciv, 1, 4, are shown instances of changes of ma- 285 nipulation obviously for decorative purposes. In fig. 4 of 531 this plate the pattern consists of a horizontal row of dots followed by a row of squares joining at opposite corners in such manner as to resemble a section of an old-fashioned lattice; this is followed in turn by another row of dots and another row of squares. This pattern exists in the dark-colored elements as well as in the white ones, and the order of the appearance of a white or a dark element upon the surface is the same for the same direction—that is to say, whether both the elements under consideration run obliquely from right to left or vice versa. The order for those running downward from right to left is thus the direct complement of the order of those running from left to right. In the first case it is over one, under one, over two, under four, once repeated. This cycle completes two rows each of the dots and connected squares, which may be considered a full set of the elements of this pattern. When the elements are taken downward from left to right, the order is: over one, under one, over four, under two.

In the basket shown in pl. xciv, 1, the manipulation of the elements is even more complex, owing to the fact that the design is much more complicated. In every case the particular pattern employed calls for regular

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

265
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numerical cycles of its own in the manipulation of the splints. In the design shown in the illustration referred to, the cycles produced by this fairly intricate pattern are exhibited in the accompanying pl. xcvi. In the first of these the cycle is that which results from following the splints downward from right to left, while the second is the result of following them downward from left to right.

[265]

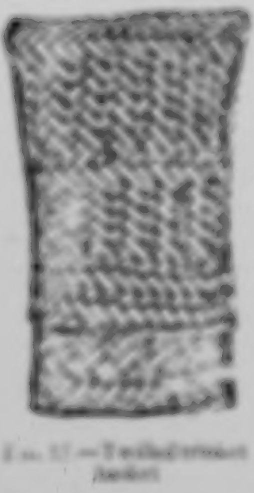

FIG. 17.—Twilled trinket basket.

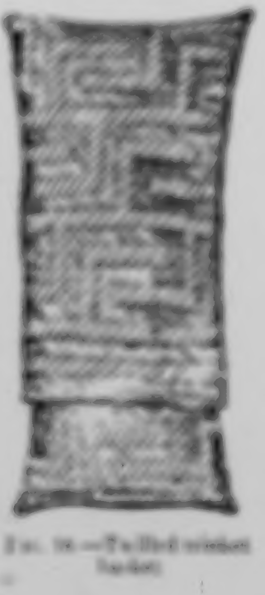

FIG. 18.—Twilled trinket basket.

Taken separately, these two show fairly similar and very simple patterns. If, however, they are superposed, the points marked being taken as initial points, the intricate pattern in white shown in pl. xciv, 1, results. From these cases and others similarly analyzed it is therefore evident that the exact mode of manipulation of the splints in all Cayapa twilling in which any intricate

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

265
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pattern is attempted is governed entirely by the pattern desired, and that any numerical cycle will be employed which will bring to the surface the elements required to produce the desired pattern.

In connection with the change of sequence of the elements in working out an elaborate design, the technical processes involved in changing the direction of a line in a simple design, such as a zigzag, should also be noted. By the very nature of this technic the angle formed in changing the direction of a line is a right angle, as may be seen in pl. XCIV, 6. The change in direction is accomplished by shifting, after the vertex of the angle is past, the point of emergence of each successive horizontal element one vertical element to the right or to the left as the case may be. In this way each of the horizontal elements continues to pass over the regular number of vertical elements as the outer surface of the basket is viewed. The same is not true of the vertical elements however. Immediately in the angle the vertical elements are so crossed by the horizontal ones that only one width appears in the case of the first element, three in the next, and five in the third, after which the two divergent lines of vertical elements run regularly over three and under three. The procedure in the over-two and under-two twilling is the same except that the odd

[415]

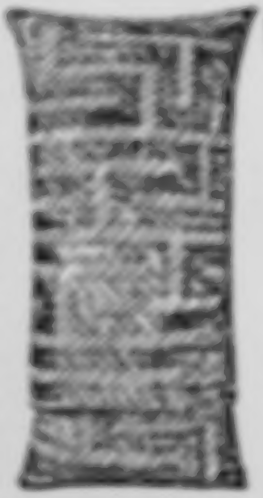


FIG. 17.—Twilled wicker basket.

[5:1]

285 numbers of elements required to change the direction of the line are one and three instead of one, three, and five.

The details of twilled basketry making are well exemplified in the case of the hamper-shape basket which is such a characteristic form among the Cayapa.

In beginning a basket of this hamper form the two sets of elements are laid down at a right angle one to the other upon a level surface, usually a piece of bark cloth spread upon the floor or upon the lap of the weaver. They are first laid with their dark sides uppermost and are crossed in the regular manner as later on in the weaving. Along this initial line the weaver may cause any given element to pass over three of the elements running at right angles to it, and this is frequently done. As frequently, however, such an element passes over one only of the elements that pass in the opposite direction, and the element thus passed over emerges from beneath and in its turn passes over the next element which is laid parallel to the one above mentioned. Thus along the middle line, that is, the starting line, of one of these baskets, there may be a single row in which the elements passing in one direction go over only one of the elements passing in the opposite direction. Beyond this point they pass in the prescribed manner over three and under three, or, in the rare instances in which this is used, over two and under two.

These methods of beginning the base of such a basket are also invariably employed in those baskets in which the sides are made in the more elaborate over-seven
285 and under-one technic above referred to. No instance
171 was observed where this more elaborate technic had been

employed upon the bottom of a basket, not even among the Cholo. [171]

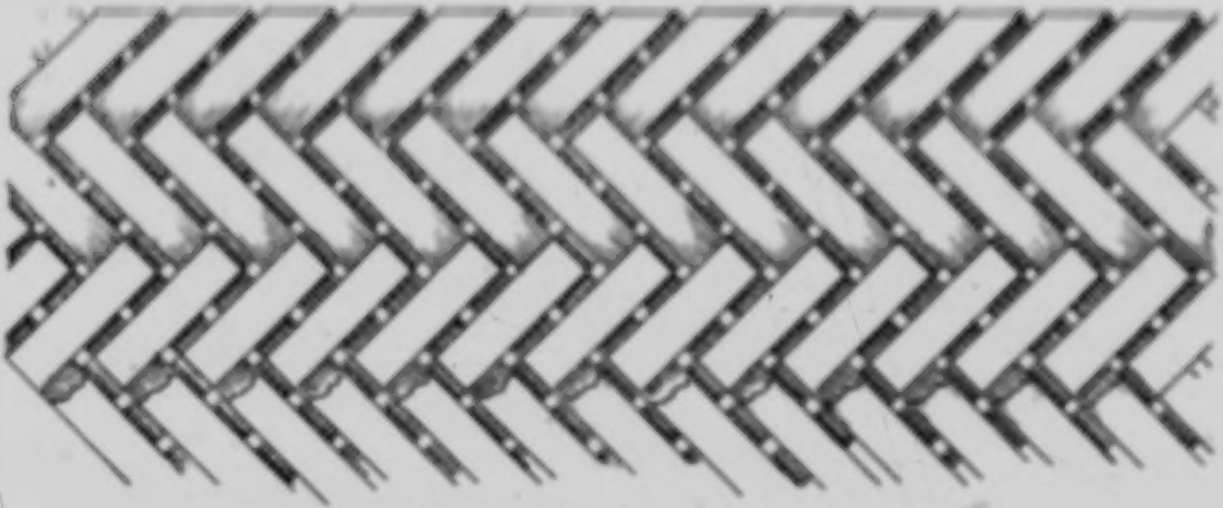
Having first laid down the elements to be used in forming the bottom of this basket, and having manipulated and crossed them properly for perhaps a couple of rows on each side of the middle line, the whole is carefully inspected and the desired design decided on. If it is determined to make a basket in which one set of the elements shall have its dark surface uppermost while the other has its light surface turned up, the elements already laid down are pulled far enough apart to permit the turning over of the one set in order to bring the light surface into view. Frequently baskets are made in which all the elements used have the same surface exposed, for it is feasible to work out a design in case both sets have the same surface uppermost. In such case the design is given purely by the technic itself; and by changing the direction of the twilling, effective results are obtained.

Having, then, determined on the pattern, and the elements having been properly arranged, the twilling proceeds with the adding of more elements as required according as the size of the bottom increases, until the proper dimensions are reached. This results finally in a quadrangular twilled area of the size needed for the bottom or for the top of the hamper, and with a great number of ends of elements, approximately equal in length, projecting from the sides. From this point on no more elements are added, the elements having been properly selected with respect to length, so that these ends are quite sufficient to complete the sides of the basket. Ordinarily two of these bases are completed before the sides of either are turned up. They are then carefully measured one to the other, since one must be a trifle larger than the other, as one becomes the upper half or cover of the hamper while the other becomes the lower half or body, and they must fit with fair exactness. At this point a string, a small piece of pitigua, or a small strip of the rampile basket material itself is passed round this quadrangular base and looped under one element at each corner, thus marking exactly the lines along which the sides and ends are to be bent up and especially the points at which the corners are to be made. After gently bending up to a vertical position the untwilled elements along the lines marked out by this string, the twilling then proceeds as in the usual manner and with whatsoever variations of design or technic may be desired until the edge of the basket is reached.

Having arrived at the edge, a piece of pita cord long enough to pass round the basket is placed in along the line upon which the elements are bent over to form the border and serves as a kind of adjustable "draw-string" which may be pulled tight or left loose as necessity demands. Without this, the edge, and later the body of the basket, would gradually work loose and become ragged, but with the draw-string it is not only possible to keep the basket intact, but also to adjust the size of its opening to that of the other half of the hamper.

As is shown in pl. XCIII, 10, 11, on completing the basket to this point there still remain the projecting ends of the two sets of elements, one set outside, the other inside the basket at its edge. These are now employed

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6



BORDER FINISH OF A TWILLED BASKET

[p. 204 (?)]

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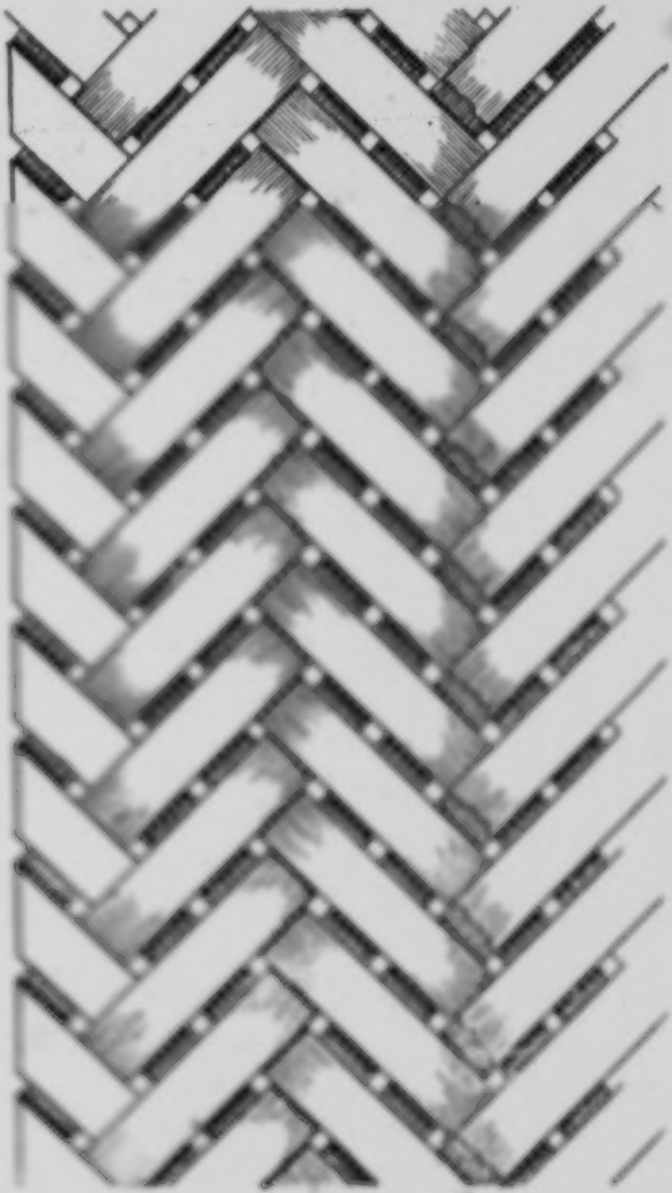
BARRETT—CAYAPA INDIANS

PL. XCVIII



BORDER FINISH OF A TWILLED BASKET

[p. 204 (a)]

in binding the edge of the basket, which is accomplished by either one of two general methods. In the most commonly employed of these the outer set of projecting ends only is used, the inner splints being cut off flush with the inner surface of the basket. In this method of binding there are three variations, as shown in pls. XCVII-XCIX. The essential features of these are the same, and involve first the turning over of each projecting splint at an angle of ninety degrees to its former course, and then passing it back down the outer surface of the basket in such manner as to bind its end securely. The most frequent procedure is to turn such a splint inward and to pass it first behind two, next in front of three, and finally behind three transverse elements on the outer surface of the basket (pl. XCVII). At its emergence at this last point it is cut off evenly with the surface of the basket. In the other two variations of this method, such an element passes behind one, in front of three, and behind three (pl. XCVIII), or behind one, in front of two, and behind two elements (pl. XCIX).

In each of the above instances there still remains upon the inner surface of the basket and projecting from about the border, the other set, or half the total number of elements employed in weaving the basket. These are simply cut off flush with the last transverse elements from under which they emerge, thus leaving this inner surface smooth. There remains then only the adjustment of the size of the opening of this half of the hamper. This is done, as before stated, with the "draw-string," which is then tied securely and holds the opening to its proper size, although it may later require adjustment, as the string stretches and the opening changes.

The second method of finishing the border involves turning both the outer and the inner sets of elements inward and passing them down the inside of the basket instead of turning the outer set only inward and passing its elements down the outer surface as just described. As these elements turn inward and downward, each takes a direction at a right angle to its former course. They are at the same time twilled together for either one or three rows down along the inner surface, thus producing at the edge two thicknesses of twilling. The ends of the inner set of elements are then cut off, while those of the outer set are simply passed down over several (in the cases in hand the number is five, seven, or nine) of the transverse elements of the regular wall of the basket and each is then securely fastened by being passed behind three transverse elements in the wall of the basket itself. On emerging from behind these, such an end is cut off flush with the surface. The inner surface of such a border is shown in pl. C.

The same "draw-string" as that used in the above-described types of border is required for this one, although this finish produces a much smoother and thicker border than the others, since there is here a double wall of twilling.

The foundations or starting points and borders of twilled baskets of forms other than the hamper are the same in principle as those employed in the hamper-shape baskets, the only variations being those which arise from the form of the basket.

The border shown in pl. XCIV, 6, is a notable exception, just as this basket itself is notably different in form and

3: Barrett E-5 (1908-1909)1925
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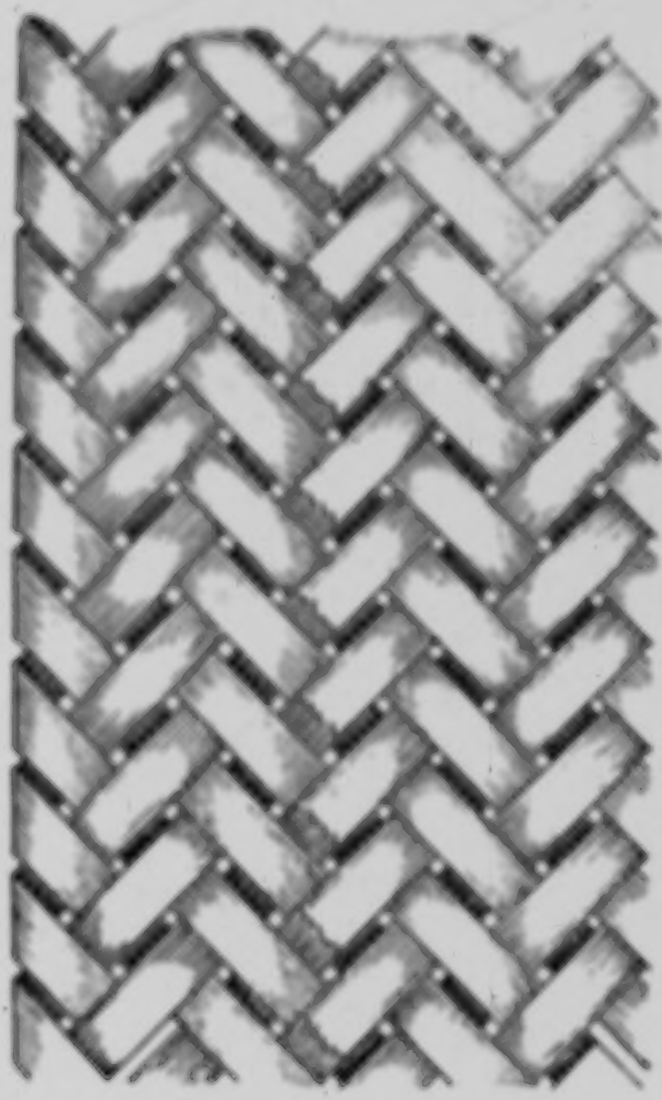

BORDER FINISH OF A TWILLED BASKET

[p. 206 (a)]

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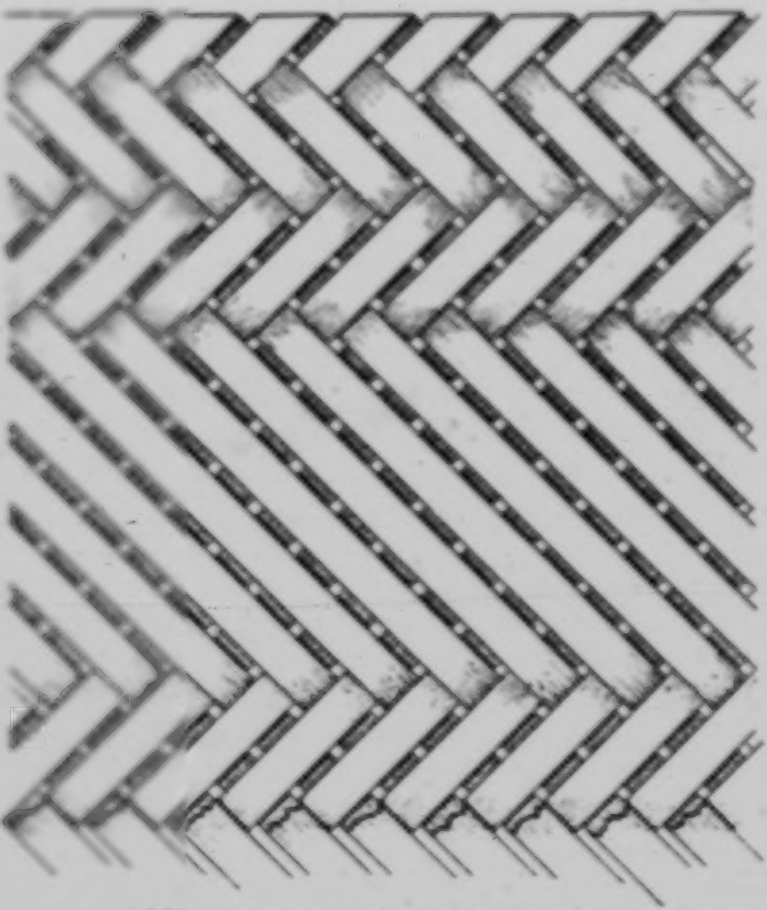

BORDER FINISH OF A TWILLED BASKET

1-06(B7)

material, as has been previously pointed out, from those 255 of this technic. The border in this case is essentially the same as that shown in fig. 8 of the same plate, which has been described in detail in speaking of the borders of wicker baskets. It differs only in that the ends of the twilling elements are turned over ~~in~~ groups of three instead of in pairs, in that one horizontal element is run around on the inner instead of the outer surface, and in that the two spiral binding elements pass in opposite directions instead of in the same direction, thus causing them to cross instead of to parallel each other.

### KA'PŨ TECHNIC

Of the three technics in which elements passing in [53] three different directions are employed, the simplest is that called by the Cayapa ka'pũ, from kapũ'ka, signifying eye, this name being derived from the hexagonal opening produced by the technic, which the Indians conceive to resemble an eye. It will perhaps facilitate the description of this technic to letter, in the accompanying illustrations, the elements used therein and the figures and angles which these produce.

Three pairs of elements are required to produce a single unit of this technic, the elements of each pair passing in their particular direction and standing in certain given relations to the remaining elements in the set. Thus, in fig. 18 the two elements A and A′ pass obliquely upward toward the right, and B and B′ pass obliquely upward toward the left, while C and C′ pass horizontally. The exact relation in which any one of these elements stands

285 to any other element is shown by this figure and need not be described in detail here. It should be noted, however, that it is by means of the third pair of these elements that the other two pairs are bound. If taken alone, any two pairs of these elements are found simply to pass over each other, while the elements of the third pair pass through the angles formed by the intersections of the elements of the other pairs and thus bind the whole figure firmly together. This holds good in every instance, no matter in what order the pairs of elements are considered. The details of this technic are well illustrated in the baskets shown in pl. XCII, 8, and XCIII, 9. An examination of these will show that the above statements concerning the relations of these pairs of elements one to another in a unit figure holds true for the entire basket, and that if one element, A, passing in a given direction stands in a certain definite relation to another element, B, passing in another direction, then all the elements which are parallel to A stand in the same relation to all elements running parallel to B.

531 The result of the crossing of these six elements is two equilateral triangles, X Y Z and X′ Y′ Z′, superposed in such manner as to produce a six-pointed star as shown in fig. 19. The central opening in this figure is a hexagon, *a b c d e f*, and it is this opening which characterizes the technic and gives the basket the name of ka'pü pickalyi, or eye-basket.

In beginning the manufacture of a basket of this technic no special knot or other device is used. Six elements are so laid on a convenient flat surface as to produce the first or central "eye," which may be considered as the initial six-sided figure about which the rest of the bottom is constructed. These elements first laid down must stand in the relations one to another that are above described. From this point on, the formation of the bottom of the basket is a simple process, consisting of adding the necessary elements in the proper order and along lines parallel to those of the original six elements above mentioned. This process of adding on all six sides of the original opening continues until a hexagonal bottom of the desired dimensions and proportions is produced. The size of such a bottom is obviously governed by the size of the basket desired. In form these bottoms are usually equilateral except in the case of the particular type of burden-basket shown in pl. XCII, 6, in which the bottom is about twice as long as it is wide.

From this woven bottom a large number of radial elements extend out on its six sides in as many groups, each group composed of parallel elements. Obviously the angle between any two of these groups occurs at one of the corners of the hexagonal woven area and is an angle of approximately one hundred and twenty degrees.

At this point in the process of weaving these radial elements are turned abruptly up to form the vertical sides of the basket. Theoretically the individual elements themselves might be brought up in a perpendicular position, or at almost any desired angle to the perpendicular, so long as the result as a whole is a vertical wall, but in practice the same technic is maintained in these sides as is used in the bottom. In order to produce this, each element is turned up in such manner that it slants along this wall of the basket at an angle of about thirty

285 degrees to the perpendicular, one set of elements slanting toward the right while the adjacent set slants toward the left, the inner angle formed by any intersection being therefore one of sixty degrees. As a matter of fact the exact slant of these elements varies considerably, and

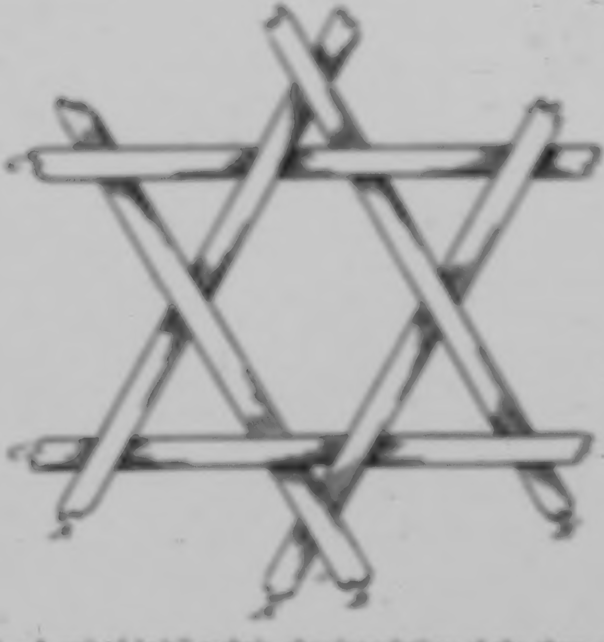

FIG. 16.—A unit of ka'yä technic, showing relations of the three pairs of parallel elements

the angles made by their intersections vary accordingly, so that the resultant figures have a variety of shapes, although all approach more or less the true hexagon as shown in the schematic figs. 18 and 19.

However, if only the elements used to form the bottom were employed in making these sides, there would be but the two sets of elements crossing obliquely and a four-sided opening or mesh would result. As has been shown, however, in this technic elements passing in a third direction are required, and it is therefore necessary to bring two new horizontal elements into combination with each set of two pairs of the diagonal elements above mentioned which go to produce the four slanting sides of the hexagon, as shown in fig. 18. These two horizontal elements cut off the top and bottom of the quadrilateral opening which would be produced by the simple crossing of the elements brought up from the bottom of the basket alone. They are produced by inserting another splint in such manner that it passes horizontally in a clockwise direction and forms a continuous spiral, passing up the

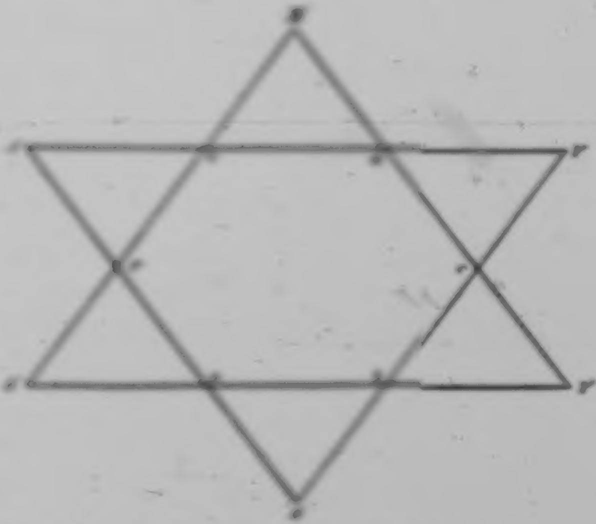

Fig. 18.—Component parts of a unit of ka'pü technic

side of the basket and cutting through the lowest and the uppermost angles respectively of the quadrilateral figures formed by the intersection of the four diagonal elements which came from the bottom of the basket. This produces two more sides and two more angles, and the result is that all the openings in the sides as well as on the bottom of the basket are hexagonal in form. As a rule a very long piece of material is used as this horizontal splint, but whether long or short it may be made a continuous spiral throughout the whole side of the basket by inserting a new splint when the end of the one in use is reached. This is done by overlapping the two splints for an inch or two and in this way giving the effect of continuity. Thus the sides and the bottom of such a basket are built up in exactly the same manner, except that, owing to the ever-increasing diameter of the bottom, it is necessary to add a new splint each time another horizontal element is required, instead of using a continuous splint which passes spirally about the basket as is done in the above-described method of treatment of the side.

In the closely allied technic called tci'nde the prevalent method of inserting these horizontal elements is by putting in a separate splint for each horizontal element in the basket. In this case each splint makes simply one complete circle about the basket and has no connection whatever with any of the other horizontal elements. So far no instance of this treatment of these horizontal elements in the ka'pū technic has been encountered. It is quite possible, however, that a larger series of these baskets might show some cases of this, just as one exception to the usual clockwise direction of the long continuous spiral element has been encountered.

There is one notable exception to this shape of opening or mesh. At the six corners of the bottom of the basket the openings are pentagonal instead of hexagonal. This is due to the fact that no horizontal element passes through the opening at its lowest inner angel (angle *c′ a′ b′*, fig. 20). A horizontal element, D, cuts across the opening at its topmost angle (angle *x y z*) and thus adds to the figure formed by the regular oblique elements, A, A′, B′ and C′, only one more side instead of adding two sides as is done when two horizontal elements are used in the regular way.

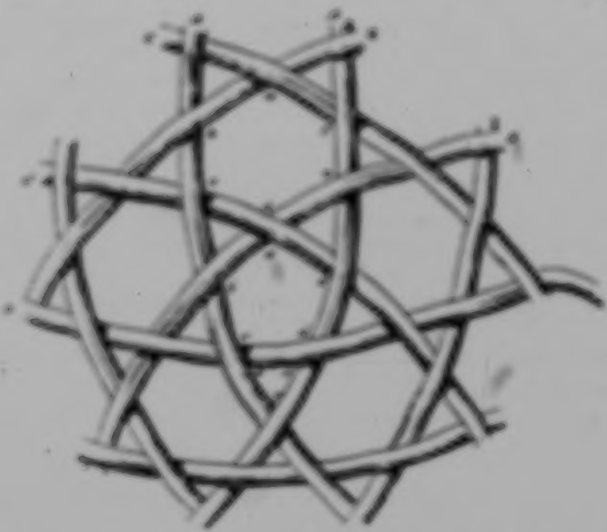

FIG. 20.—Pentagonal opening at one corner of the bottom of a basket of ka'pü technic

The reason for the absence of this second horizontal element in this opening is that the element C′, which was the upper horizontal element used in the preceding mesh, *a b c d e f*, now changes its course as it turns upward to enter the side of the basket and becomes one of the diagonal elements. At this transition point between the bottom and the side this element C′ really occupies the same position and stands in the same relation to the remaining elements at this point as does the regular lower horizontal element in any other mesh. If a lower horizontal element were really to be inserted at this point, it would necessarily cut across the present angle *e′ a′ b′* and would stand in the same relation to the other elements it would cross that the element C now occupies in crossing A′ and B to form the two angles *f a b* and *e f a*. As a matter of fact, however, C′ now occupies exactly this position, so that no extra element could be inserted at this point.

It is an interesting fact that, when the horizontal element which runs as a spiral about the basket is added, it is not simply inserted at the point where it becomes active as a horizontal element, which is always at one of the points of the hexagon which constitutes the bottom of the basket, but the initial end of the element passes back diagonally up the side and serves as a diagonal element the same as if it were one of those originally used as part of the bottom.

Furthermore, it should be noted that in all the cases at hand, except one, the spiral so produced progresses in a clockwise direction as the exterior surface of the basket is viewed. This is in accord with the observed tendency of Cayapa weavers in general to proceed in their work toward the right, so that the isolated instance in which the spiral progresses in a contra-clockwise direction is quite striking.

The regular process of weaving, as above described, continues until the border of the basket is reached, where any one of several methods may be brought into play in finishing the border. The one most usually employed is that of bending toward the right, at the border, each pair of diagonal elements at their last point of intersection at the very edge of the opening, passing these inward and downward behind a single strip of pitigua, and then out upon the outer surface of the basket. They then pass more or less obliquely across the adjacent pair of intersecting splints, and finally back onto the inner surface of the basket, and either simply behind the next pair of intersecting splints or behind these and then outward through the mesh next below. There is almost invariably employed a spiral wrapping about this border, sometimes in one direction, sometimes in both, which latter method makes two crossing spirals. As this wrapping of the edge is done, there is ordinarily placed along the outside of the basket, at its edge, an extra splint which is included in the wrapping, thus giving greater strength and greater rigidity to the basket. Now and then one of these extra splints is added on the inside as well. Furthermore, occasionally a basket is found in which the loose ends of the diagonal elements are simply bent over and laid horizontally along the edge and are included within the spiral wrapping.

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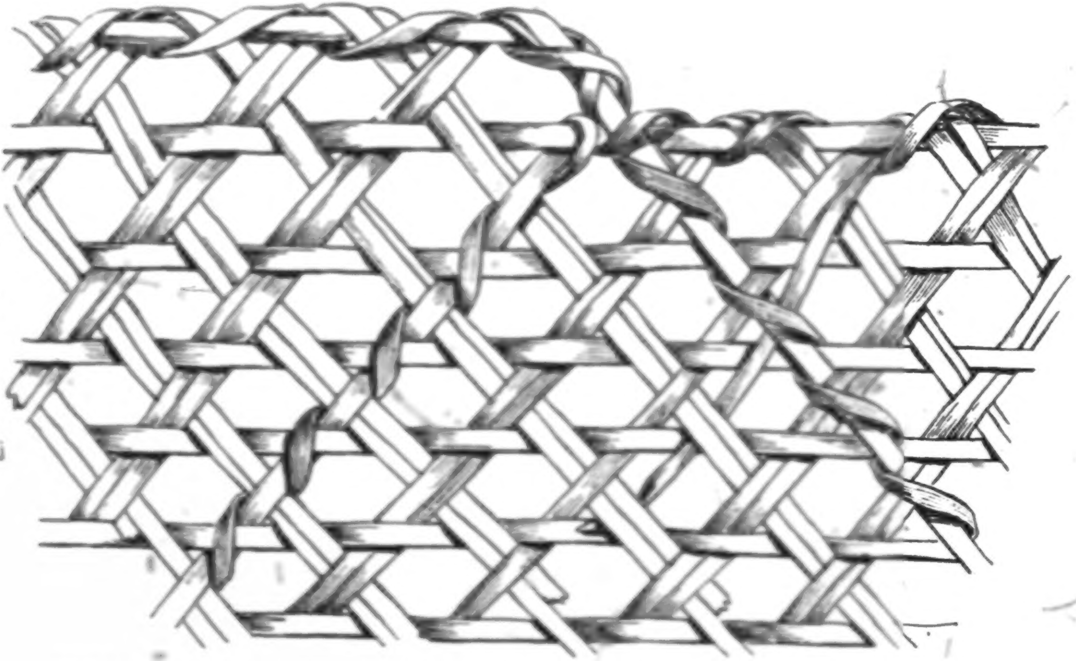
SD 6 Cayapa SD6

285 In burden-baskets of the type shown in pl. XCII, 8, and occasionally in other forms also, there occurs a very simple type of border finish, in which the ends of the diagonal elements are merely turned downward over the last horizontal element and made to pass along parallel to one of the regular diagonal elements forming the side. Such a border is shown in pl. XCIV, 12. In this particular case these returning diagonal elements pass upon the side of the horizontal elements opposite from those occupied by the corresponding original diagonal elements. Also they pass through the wall of the basket out in the hexagonal opening at any given point. As shown in pl. CI, such a returning element often takes exactly the same course as that of the corresponding original diagonal element, and it frequently passes through one of the very small triangles formed by the technic instead of through the hexagon. In fact it is sometimes superposed upon this original diagonal element to a certain extent. Further, this figure shows an interesting feature in that the wrapping of the border is continued down into the side along one diagonal line, while one of the ends of an original diagonal element is bent back on itself and passed back down into the side of the basket as a similar wrapping.

This ka'pū technic is perhaps more frequently applied than any of the others employed by the Cayapa in basketry. It is, however, confined entirely to basketry, and for this reason should be considered as ranking next to twilling, which is used in making mats and fans as well as basketry.



BORDER FINISH SHOWING RETURN OF DIAGONAL ELEMENTS AND WRAPPING

[p. 216(A)]

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

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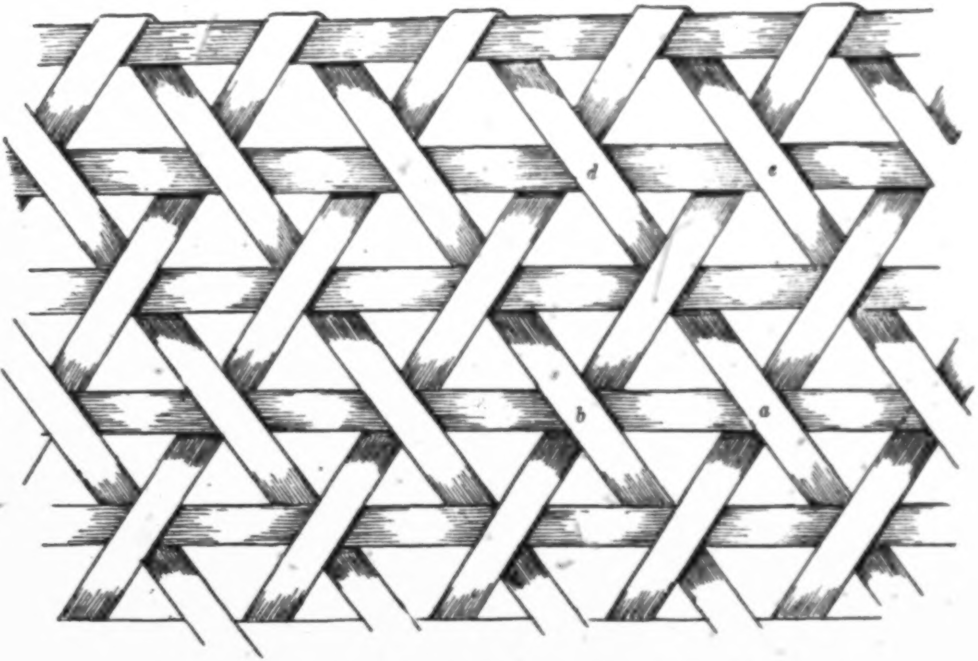
SD6 Cayapa SD6

[p.216(8)]



TCĪ'NDE BORDER WITH ELEMENTS RETURNED BELOW

### TCĪ′NDE TECHNIC

The second of the technics in which elements passing in three directions are used is that called by the Cayapa tcī′nde, a name for which no translation could be obtained. The details of this technic are shown in pl. XCIV, 11, and pl. XCV, 4, 8, 10, 13. In pl. XCII, 1, is shown a typical basket of this technic. This, however, is one in which the diagonal elements of the sides are returned downward and produce a complicated form of the technic.

In detail the tcī′nde technic is identical with the ka′pū technic, except that there is added another horizontal element which bisects the hexagonal opening of the ka′pū and gives two trapezoidal openings (fig. 21). This is done by passing a splint horizontally through the angles at *c* and *f* (fig. 19) in such manner that it passes between the two diagonal elements which cross each other to form the angle of the hexagon at each of these points. The new horizontal element passes, therefore, under B and B′ and over A and A′ (fig. 18). This is the simple course of such a third horizontal element in its relation to a single one of the hexagonal openings of the ka′pū technic. Its course throughout a series of these openings on the side of the basket is the same as that outlined for a single opening, so that this third horizontal element passes continuously in this manner from one opening to the next throughout the whole series in the sides of a basket.

Such is not the case, however, on the bottom of the basket, where a special manipulation is employed, as is

285 shown in pl. xcv, 4. Beginning with the hexagonal opening which forms the center of the bottom of the basket, the end of this third horizontal element is passed through the opposite angles at *c* and *f* of the hexagon (fig. 19), thus cutting this initial hexagon into two fairly exact trapezoids. In the instance shown in pl. xcv,

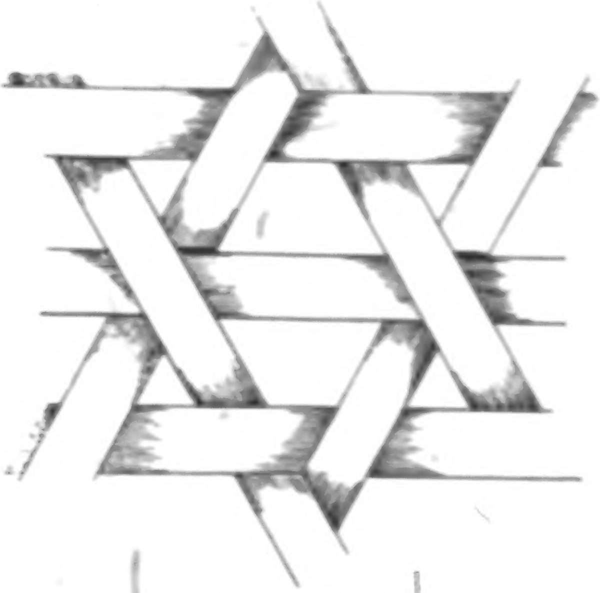


Fig. 21.—Detail of tci'nde technic

4, this initial insertion is so made that the horizontal element does not pass directly across the hexagon, thus forming two exact trapezoids, but in the majority of instances these figures are of fairly exact form. This element, after passing between the two diagonal elements which cross at *f*, extends on into the next hexagonal opening toward the left as the bottom of the basket is

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SD 6 Cayapa SD6

viewed. At this point the fundamental difference between the treatment of this third horizontal element on the bottom of the basket and that which it receives on the sides, begins to manifest itself. If this element on the bottom followed exactly the course which it does on the side of the basket, it would obviously go directly out in a straight radial line from the center of the bottom. Instead it folds under in such manner as to change its direction sufficiently to enable it to take a course toward the second intersection of elements forming the hexagon from that through which it has just passed. This brings it to one of the angles (angle *f g h*) formed by the crossing of the lower one of the horizontal elements forming this hexagon and one of the diagonal elements. It does not pass between these two elements, but entirely around them at their intersection. It then passes across the opening to the diametrically opposite angle of the hexagon. Here it passes between the two crossing elements, after which it again changes its course and passes directly to the next angle on the left. At this point it takes another turn around the intersection of the two elements which cross here and again goes to the diametrically opposite angle where it passes between the two elements that cross at this point. Thus, by a repetition of this process, this third horizontal element is made to move in a clockwise direction, as the bottom of the basket is viewed, and is caused to take a spiral course which makes it cross successively each of the hexagonal openings of the entire bottom of the basket. In every case except the first the change of direction is given by a move from the angle at which

235 this element enters a given hexagonal opening to the angle next adjacent in a clockwise direction. In the first case this move is one of two angles in a clockwise direction instead of one. This variation produces an interesting sequence in the number of openings passed over by this element in a given complete circle. The first four changes of direction after the element leaves the hexagon in which it commenced cause it to pass over one opening only in each case. It then passes over two openings, this time running parallel to the initial direction it had at the outset. It next crosses one opening only, after which it crosses successively two openings each time for the next four changes of direction. On again reaching a point where its direction is parallel to that which it had initially, it crosses three openings, after which it drops to two, which in turn is followed by four sets of three openings. Thus by a series of these concentric hexagons in which the numbers of openings all follow the sequence above outlined, but with numbers which increase one each at each new revolution in the spiral, the entire bottom is built up until this special treatment of this third horizontal element finally gives place to its regular manipulation when the side of the basket is reached. The cycle may be reduced to a kind of formula in which $x$ equals the fundamental number of openings passed over in any given complete circle of the horizontal element. The formula would then be $x + x + x + x + (x + 1) + x$.

It should be observed that in making this bottom the third horizontal element always stands in the same relation to any certain element in any given turn of its

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SD 6 Cayapa SD6

spiral course that it does in any other turn. An inspection of fig. 4 of pl. xcv will show this to be the case, and that where this third element passes round any certain element in one turn of the spiral it always passes round the same element in every other turn of the spiral. 285

On finally reaching the edge of the bottom, the looping of this horizontal element ceases, since this course is necessary only in order to increase the diameter of the bottom, just as the other horizontal elements are constantly added for the same purpose. The manipulation of this third horizontal element then changes, and it runs, as above described, either as a continuous spiral or, as is much more frequently the case, as a series of single detached bands, each passing completely around the basket.

In the cases in which the spiral treatment of this third horizontal element is employed, the horizontal elements which form the top and bottom of the hexagon are furnished by another spiral running parallel to this third element which cuts the hexagon into its two trapezoidal figures. Like the spiral element on the side of a basket of the ka′pū technic, the initial end of this one commences at the edge of the basket and runs down as a regular diagonal element to one corner of the bottom, where it changes its course to the horizontal spiral above mentioned.

In one instance in which the bottom of a basket is made in the ka′pū technic while the sides are in the tci′nde technic, the two long spiral elements required to produce the latter pass down the side of the basket immediately adjacent to and parallel to each other, and enter it at the same corner of the bottom.

Any one of several border finishes may be used at the edge of a basket of this technic, but there is one border which is the result of a variant of this technic and which is similar to one of the border finishes used in connection with the ka′pû technic.

In this variant the two sets of diagonal elements, one of which reaches the rim of the basket on its outer surface while the other reaches it on the inner surface, are turned directly downward over the last horizontal element at the edge of the basket and each element is passed back down into the body. This is so done that each returning element of one set takes the direction of the opposite set, and so that each element passes in and out of the openings in the regular tci′nde technic in such manner as to include between each pair of crossing diagonal elements one of the horizontal elements. Thus one of these diagonal elements passes over the two original elements which crossed at *d* (pl. CII) under the central horizontal element at its middle point, and over the two elements which intersect at *a*. The returning element passing in the other diagonal direction passes below at *c*, above and across the central horizontal element at its middle point and again below the two elements which intersect at *b*. An example of this technic is shown in pl. XCV, 10, and CII. In this manner each horizontal element in each unit of the technic is included between two of the diagonal elements.

This method of employing the returning diagonal elements produces a very tightly woven basket and may be used on the sides only or it may be made to cover also the bottom. As a rule both these forms of this technic are used chiefly in the making of cylindrical storage baskets of various sizes.

### DŌ TECHNIC

The third of the technics in which the elements pass in three directions is that known to the Cayapa by the name dō. This technic in basic principles is similar to that called ka'pū, and differs only in that in any single unit of the technic there are three additional splints each of which passes through opposite angles of the hexagon, as is shown in the accompanying figs. 22 and 23. This divides each of these hexagonal openings into six small equilateral triangles and forms a relatively tightly-woven basket, when compared with the ka'pū and the tci'nde technics.

In each unit in both the ka'pū and the tci'nde technics there are, in addition to and surrounding the principal openings (which in the one case is a single large hexagon, and, in the other, two trapezoids), six very small equilateral triangles, formed by the superposition of the two large equilateral triangles that make up the geometric basis of the technic unit. In the case of this dō technic, however, there are twelve of these openings, all equilateral triangles and all of about the same size.

Perhaps the most striking feature of a basket made in this technic is the presence of three pairs of heavy splints running radially in its bottom, as is shown in fig. 23 and in pl. xcv, 6. Each of these pairs is used

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SD6 Cayapa SD6

285

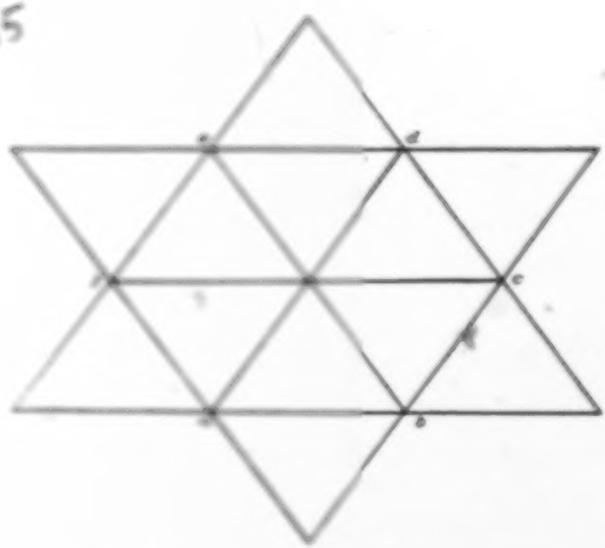

FIG. 22.—Component parts of d5 technic

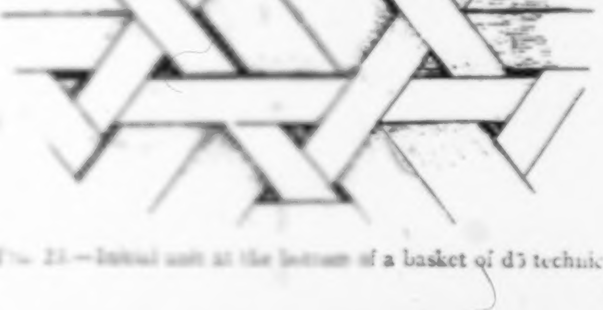

FIG. 23.—Initial unit at the bottom of a basket of d5 technic

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SD 6 Cayapa SD6

285

in the bottom itself in exactly the same manner as a single splint would be, and each passes through two opposite corners of the hexagonal bottom. Thus these three pairs of splints pass out of the bottom at its six corners. On entering the sides, however, each of these pairs is divided and each element of a pair takes an independent diagonal course up the side of the basket, thus producing in its sides twelve elements independent from the three which cross the bottom. In most cases when one of these pairs divides, its units diverge and form angles of approximately sixty degrees one with the other, but in other instances they pass as independent parallel elements diagonally up the side of the basket. Sometimes both these methods of treatment are found in a single basket. As above stated, in the majority of instances these divergent elements take a diagonal course up the side of the basket, but now and then a basket is found in which one of them runs vertically while the other takes the usual diagonal course, as is shown in pl. XCV, 15, and frequently instances are found in which one or the other of such a pair of elements takes a course more or less approximating the vertical, as shown in pl. XCIV, 9.

In a cylindrical basket the straightness of the walls produces hexagons which are approximately equilateral, but in the rare type which has flaring walls the diagonal elements in the sides gradually diverge toward the opening of the basket in such manner that these hexagons are much elongated laterally. In no case, however, are extra diagonal elements inserted on account of this enlargement of the circumference of the basket toward its rim.

285 The horizontal elements in the sides of such a basket are produced, as in the case of both the ka'pû and the tci'nde technics, in one of two ways. They may be and usually are, the result of a single spiral splint which first passes diagonally down the wall of the basket and enters the side at one of its six corners where the bottom and the sides join; from this corner onward it proceeds as a spiral until the border is reached. The second and a very rare method of securing these horizontal elements is by inserting a new complete band for each element. The ends of such a band are made secure by overlapping, the point at which any particular band overlaps being some distance around to one side or the other from the overlapping of the elements next above and below, thus giving added strength to the technic.

As in the other two technics of this group, the diagonal splints in the sides of a basket of this dō technic are all employed in the construction of the bottom of the basket, and in no instance are any more diagonal elements added in weaving the sides.

The nature of the dō technic is such that there is no possibility of returning the ends of the diagonal elements downward even from the edge of the basket, as is sometimes done in the ka'pû and the tci'nde technics, where this treatment of these elements forms one type of border finish. The triangular openings are so small, and the basket therefore so closely woven, that the returning of these elements down the side of the basket would be highly infeasible if not entirely impossible.

A notable fact connected with the manipulation of these elements is that in this particular technic the diagonal element which passes upward toward the left 285 is almost always the one which passes between a horizontal element and the other diagonal element which passes up toward the right at the points where the three cross one another. This condition is quite different from that in the tci'nde technic, for here what has been called the third horizontal element passes between the two diagonal ones. No comparison can be made with the ka'pü technic, since there is no point in this where three elements are crossed.

In finishing the borders of baskets of this technic the pairs of diagonal elements are usually bent inward and toward the right over a rod of pitigua, the ends of each pair being made to pass out in front of the pair next adjacent and toward the right, and finally down behind the second pair toward the right. To this simple binding, which in principle is the same as that most commonly used in baskets of the ka'pü and the tci'nde technics, there is frequently added a wrapping of pitigua such as is shown in pl. XCIV, 9. Even more 285 elaborate bindings, such as that exhibited in pl. XCV, 171 15, are sometimes used by the Cayapa, while among the Cholo a very elaborate one, shown in fig. 16 of the same plate, was found. In its essentials the first is the same as that above described, and it differs only in the number of elements (from three to five) bent over in each group, in having an extra horizontal splint bound along the outside, and in having three courses of wicker run into the relatively large openings just below the bound rim.

The second mentioned binding is essentially the same as that just described except that the ends of the pairs

3: Barrett E-5 (1908-1909)1925

SD6 Cayapa SD6

285
171

of elements when they reappear upon the inner surface of the basket are made to pass down under the similar pair next to the right, as is shown in pl. xcv, 16, which exhibits an inside view of this border. Thus there is produced a technic somewhat resembling what is commonly called herring-bone. The extreme edge appears to be very elaborately wrapped; this, however, is due to the manner in which two broad, flat wrapping elements are brought around it. So far as observed, this particular type of border finish does not occur among the Cayapa, although it is frequently employed by their Cholo neighbors, with whom this particular technic itself is more commonly used. In fact it is rather rarely used by the Cayapa.

### BANDILAS TECHNIC

285 The technic called ba'ndilas by the Cayapa is the only one of the six technics employed by these Indians which has elements passing in four different directions. A horizontal, a vertical, and two opposite diagonal elements are required in this technic. Unlike the several above described, no special method is required in commencing a basket of this technic, its bottom being woven in exactly the same manner as are its sides. The horizontal elements on the bottom turn up, as do the diagonal and vertical ones, to form the elements of the sides. Obviously those elements, which are horizontal upon the bottom of the basket, become vertical when turned up to form the sides, and there is then the necessity of introducing other horizontal elements. This is ac-

complished by introducing complete bands which pass round the basket and whose ends overlap. The spiral horizontal element is never used in this technic as it is in some of those above described. The bottoms of these baskets are almost always rectangular, but not square, and the basket as a whole appears somewhat more angular than do the baskets of other technics except the hamper-shape twilled baskets, in which angularity is especially sought. A basket of this technic is shown in pl. xciii, 3.

The border of such a basket is finished in a manner similar to that employed in finishing the borders of baskets of the ka'pä and tci'nde technics above described. The vertical and diagonal elements project above the border and at their points of last crossing form sets of three elements, one vertical and two diagonal crossing at the same point. These three are as a unit turned inward and downward, passing diagonally out and in front of the next set toward the right and finally inward and behind the next set. As these sets turn downward they pass over a horizontal splint, which is thereby included in the fold of each set of three elements. There is usually placed also a similar horizontal splint on the outside of the basket and one on the inside, the whole edge being bound by one or two spiral elements. One or the other of these outer horizontal elements may be omitted, but ordinarily both are present. In pl. xciv, 10, and pl. xcv, 9, are shown two examples of borders in which are present two spiral elements running in opposite directions. In both these also the inner and outer horizontal elements are present. In the example shown

285 in pl. xcv, 11, on the other hand, the outer horizontal element is absent and there is but one spiral element. In this instance, however, there are two horizontal elements running like wicker through the openings immediately below the border and serving to give additional strength to it.

Baskets of this technic are among those more rarely made by the Cayapa. They have no special use, but serve any of the many ordinary household purposes to which Cayapa basketry is put, such as the storage of small articles and various foods.

In addition to the six technics above described, here termed the regular basketry technics, there are the two employed to a very limited extent in making the palm-leaf burden-baskets, which are used temporarily and only in emergencies for carrying burdens, or are now and then employed ceremonially by some shaman in his medicine practices. Two of these baskets are shown in pl. xcii, 2, 5.

285
324 In the first the technic resembles checkerwork to a certain extent. Such a conical basket is made from a single large pinnate leaf of the palm called by the Spanish chapil and by the Cayapa kūla′pō-tcī. Such a leaf is often as much as ten feet long. Perhaps eight feet of this is serviceable for basket-making, the two feet near the tip of the leaf being rather weak and provided with short leaflets. Having broken off the unserviceable section at its tip, such a leaf is bent at its middle point and its leaflets are interwoven after the fashion of checkerwork, thus producing a loosely woven basket with large meshes. The remaining ends of the

leaflets are at last wrapped about the edge and bound 285
loosely to secure them and produce the border of the 824
basket.

The second type of palm-leaf basket is square in cross- 285
section and has vertical walls. In this, two leaves which are made to cross each other at the bottom are used. The bottom of such a basket is usually about a foot square and the walls are two and a half or three feet high. The midribs of the leaves pass up the middle of the sides, and the leaflets, entirely unwoven, form the sides themselves. Extending up the four corners are heavy rolls formed by these leaflets, and it is in these that the particular technic employed only in this type of basket is found. When the two midribs are crossed at their middle points, they are securely bound together to keep them in position during the manipulation of the leaflets in making the corners of the basket. At a point five or six inches from this center, each of the midribs is then bent upward. As the leaves are thus placed in position, the leaflets extending out from the right-hand side of one midrib cross those extending from the left of the adjacent midrib. Beginning at the bottom, one of these leaflets is passed round a corresponding leaflet of the opposite set, its end joining that of the leaflet it has just gone round in passing upward to help form a core about which the other leaflets are in turn passed. In passing about this core each leaflet goes completely round it, coming back to the front below itself and then folding abruptly upward over itself to enter the core. This produces the technic which in the preceding pages was likened to the "half-hitch" in

285 cordage. By this process of passing these leaflets from first one side and then the other round this core of leaf-ends, a corner of the basket is built up to its topmost point, where the ends of the last two or three leaflets are tied in such manner as to prevent the corner from loosening. In the same manner all four corners are built up and the basket is then complete.

### FORMS AND USES

285 415 According to form and use, Cayapa basketry may be classed as follows:

| | |
|---|---|
| Burden-basket, flaring, | kū'bī (pl. xcii, 4, 7). |
| [482] Burden-basket with vertical sides and carried usually by means of two shoulder-straps, | fe' pickalyī, fe hi'nū pickalyī e' pickalyī (pl. xcii, 8). |
| Square-sided, temporary burden-basket of hoja de chapil, | kūla' pickalyī, kūla'pō pickalyī, (pl. xcii, 5). |
| Common cylindrical basket, | picka'lyī (pl. xcii, 1, 3). |
| Hamper-shape basket, | pū'*te* (pl. xciii, 2, 5, 6, 10, 11). |
| Bottle-shape bait basket, | tū'ñūtcītcī, dyūñūtcī'tcī, (pl. xciii, 3). |
| Tubular basket used for spindles, | tcūrūkū'kū, tīwōtcī'tcī (pl. xciii, 8, 12). |

In addition to this classification, in which baskets used for certain purposes are of special forms, there are other terms indicating use which are applicable to a basket of any form, material, or technic. For instance, the name pū-pickalyī, from pū'ka, "fruit," and picka'lyī, "basket," may be used in speaking of any basket in which fruit is carried or stored.

As indicated in most instances by the names in the

above tabulation, these several distinct forms of baskets 285 415
have special uses. The four types of burden-basket [482]
are used almost exclusively for carrying heavy loads
upon the back. The two types made of hoja de chapil
are, as above stated, only for temporary use and are
worthless except while the leaves are green. They are [755]
also sometimes used, even after they are dry and brittle,
by the shamans in their medicine practices. The other [251]
two types, which are made of the very durable pitigua,
are sometimes used as storage receptacles about the
house when not needed for carrying burdens, which is
their primary use.

The flaring basket, kū′bī (pl. XCII, 7), is carried by 285
means of a single band provided with a special, wide 482
head-band that passes across the top of the head as the
bearer bends forward. This is primarily a woman's
burden-basket and is used in the daily home life of the
people for bringing fruits and other products from the
fields and in a multitude of other ways. It is, however,
rarely used in carrying wood, which is so often one of
the most important functions of burden-baskets among
aboriginal peoples. Wood is usually brought by the [313]
canoe-load from some point near the river where a
suitable dead tree can be found.

The straight-walled basket, fe′ pickalyī (pl. XCII, 6, 8), is made especially for carrying burdens considerable distances, as on long trail journeys into the interior. Within their own territory these baskets are rarely needed by the Cayapa, since practically all travel is by canoe. Such a basket is provided with two burden-bands attached near the top and the bottom respectively, 285 482 and so placed that the broad bearing surface of each band stands vertically. These bands pass across in front of the shoulders after the manner of the straps of a knapsack. In the case of a large basket, such as that shown in pl. xcii, 8, the cords of the burden-bands pass round the basket to give the load greater security. Further, to add strength, and especially rigidity, to such a basket, two palm-wood rods are placed vertically on the inner surface of the basket, each being so placed as to be directly at the line along which one of the burden-bands is attached. The band is made to take a turn round this rod at each point at which it is attached to the basket. These rods are also of particular service in preventing the cords of the burden-bands from tearing out the relatively slender elements with which the weaving is done, when the basket is used in carrying such a load.

285 415 What is here termed the common cylindrical basket (pl. xcii, 1, 3, and pl. xciii, 4) has no special use other than as a general storage receptacle for foods, etc. Such baskets are frequently kept in the loft or hung under the eaves of the house when containing articles only occasionally needed.

285 415 425 Perhaps the most useful basket of all those made by the Cayapa is the hamper-shape basket, pū'*te* (pl. xciii, 2, 5, 6). This basket serves a variety of uses, chief among which are the storage of clothing and other valuable articles, and as a traveling case. No Cayapa enters on a journey of more than a day without one of these hampers, in which are his mosquito canopy, clothing, face-paint, any jewelry he does not wish to wear, and

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SD 6 Cayapa SD6

any other articles of value he does not deem it safe to leave at home. 285 415 484

These hampers, especially when used in traveling, are tied about the middle with a cord or a woven band, and can be tumbled about without danger to their contents. They are frequently kept filled with articles in storage in the loft of the house, and often are suspended by the above-mentioned cord or band from the rafters or from one of the timbers at the eaves. Sometimes these baskets are made for special purposes. This is the case with the long one shown in pl. XCIII, 2, which was made especially for the storage of spindles, though the usual spindle storage-basket is a long tubular one like those shown in figs. 8 and 12 of the same plate. Another special form is the very small hamper-shape basket, such as those shown in figs. 15–17; these are used as receptacles for trinkets. 285 415

The bottle-shape bait basket, tū'ñūtcītcī (pl. XCIII, 3), is a very specialized form and, as its name implies, is made for the particular purpose of carrying live insect bait in the canoe while fishing. Its narrow neck is provided with a balsa stopper or with some leaves made into a bundle which serves the same purpose. [227]

Tubular baskets, called tcūrūkū'kū (pl. XCIII, 8, 12), are made especially for the storage of spindles, either full or empty. These baskets are usually from thirty to forty centimeters in length by from seven to fifteen centimeters in diameter. Such a basket is hung by one edge of its opening, so that it hangs at more or less of a slant. It is usually suspended from a rafter or other part of the house-frame near the eaves, within easy 283 285 415

283 reach from the floor. The Cayapa women are very
285 industrious, and whenever not occupied about the daily
415 routine of their houses and fields, are spinning and weaving. The spinning tripod (pl. CVIII) is always kept in a convenient place at one side of the house, and one or two spindles are usually kept on the small woven shelf near the bottom of the tripod. All extra spindles, whether empty or filled, are, however, kept in these long tubular baskets. When several spindles are filled they are emptied by winding the thread into balls, in which form it is stored until needed.

231 One very special form of basket not mentioned in the
285 tabulation above is the large bottle-shape basket shown in pl. XCIII, 7. This unusual basket was made as a cage for a chicken. As a rule, rough baskets of the usual cylindrical form are utilized for this purpose, the opening being closed by binding its edges tightly together with a pitigua cord. This bottle-shape basket was the only one of its kind encountered, and no Cayapa name was given for it.

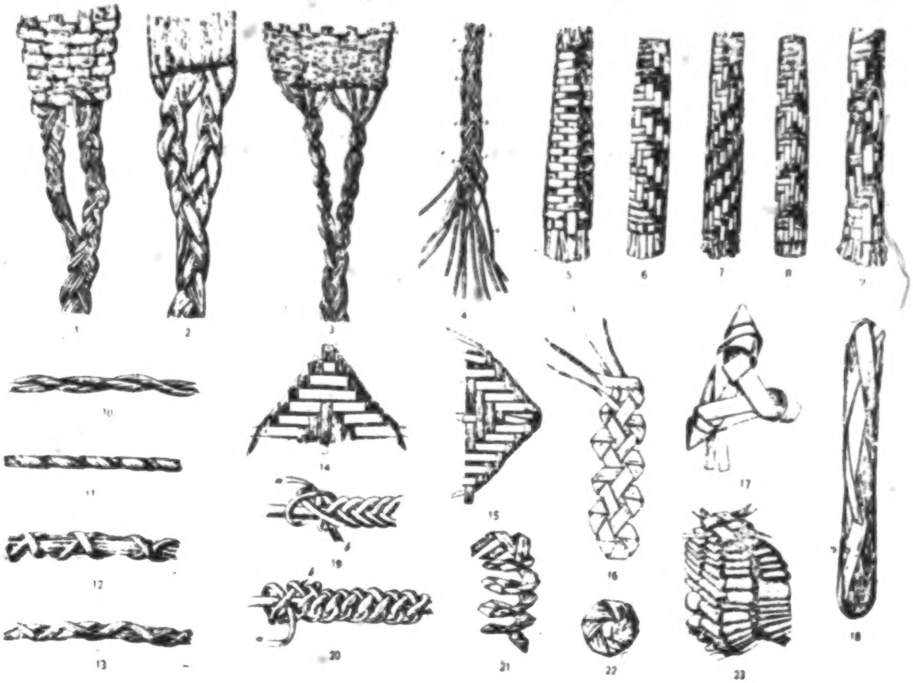
### BASKETRY HANDLES

285 Most of the ordinary cylindrical baskets of small or medium size, regardless of technic, are provided with handles or bails such as those shown in pl. XCII, 3, and XCIII, 4. These handles are always of pitigua and are made in several forms.

The simplest handle consists of a plain piece of pitigua of the proper length, usually unsplit, tied at diametrically opposite points through the border of the basket. Usually it is passed through and brought up far enough

BARRETT—CAYAPA INDIANS

PL. CIII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HANDLES OF BASKETS AND FANS, AND BURDEN-BANDS

[P. 236 (a)]

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

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3: Barrett E-5 (1908-1909) 1925

SD 6 Cayapa SD6

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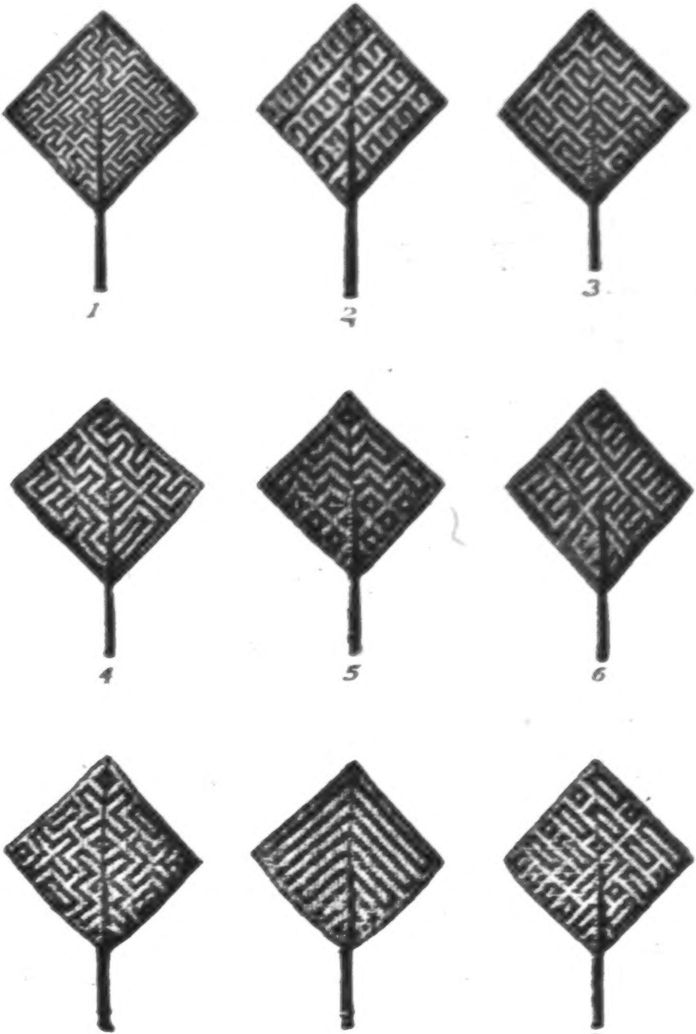

FANS

[p. 236 (B)]

to tie in a slip-knot, thus giving it a secure hold. In cases where no considerable weight is to be borne by it, however, it may simply be passed through the sides and knotted at each end. 285

The construction of five of the more elaborately made types of handle are shown in pl. CIII, 10–13, 19, and 20. In that shown in fig. 10 the construction is simple, an unsplit piece of pitigua being passed through the sides of the basket and twisted about itself after the manner of a two-ply cord, the ends of the pitigua being tied together.

The handle shown in pl. CIII, 11, is similar to the one just described, except that the pitigua is flat, and there is no attempt at twisting; instead, the second element of the handle is simply wrapped round the first. The two handles shown in figs. 12 and 13 of the same plate are similarly constructed save that there are two central elements while the wrapping elements are respectively two and three in number. In all these the sole endeavor appears to be to secure sufficient strength.

In the handle shown in figs. 19 and 20 of the plate, however, there appears to be a definite attempt at ornamentation, since there is added to the central section of the handle, which is otherwise a single unsplit piece of pitigua, an elaborately woven covering, as it may be called. One side of this, usually placed as the upper side, has a herring-bone appearance, as shown in pl. CIII, 19, while the other side appears as in fig. 20. The details of the construction are also well shown in these illustrations and need not be further described.

### BURDEN-BANDS

285 482 The burden-bands made by the Cayapa are used almost if not quite exclusively in carrying the two types of burden-basket above described. These bands, called in general ta′ñla, consist in every case of two parts: the broad "head-band," called in Cayapa pickai ka′ñnū, and the two long cords which pass round the basket, called picka′lyi nō tetsūī pañnū. These burden-band cords are made in two technics: a plain braiding (pl. CIII, 1–3), called wa′tse′*t*a, and an elaborate technic which produces a cord, square in cross-section (pl. CIII, 4), called pī′Xta kalara, or bi′ñda kalara.

The Cayapa recognize four kinds of burden-bands. The simplest of these (pl. CIII, 2) is made of kuna-kuna bark and is called wa′tcī kīka tañla. A strip of this tough fibrous bark, from two to three inches in width and of a length equal to the total length of the burden-band, is selected and its ends are shredded so as to leave an unshredded section of the natural bark about twelve or fifteen inches in length in the middle. This forms the head-band, and at its two ends it is sewed across with a piece of pita string to prevent splitting. The shredded bark immediately adjacent to this section is then divided into two parts, each of which is braided separately for a few inches, after which the two are merged into a single braid which continues on to the end of the cord. These details are all given in the section shown in pl. CIII, 2. The outer surface of this bark is rough, but the inner surface, which is quite smooth and soft, is used as the bearing surface of the band. This particular type of burden-band is sometimes used upon the forehead, but is more frequently employed as a shoulder burden-band. 285 482

A second type of burden-band is that shown in pl. CIII, 1, which is made of pitigua and is called by the Cayapa te'tsū tañla. In this the head-band is made in wicker with fairly broad strips of pitigua used as warp and a broad strip of the same material passing back and forth as woof. These warp strips are then split and made in two small braids that later merge into one larger braid as is shown in the illustration last mentioned. This type of burden-band is used almost exclusively in connection with the flaring burden-basket, which is supported by the band passing across the forehead. The remaining two types are made of the slender but very strong fibers of the palma real and differ one from the other only in the technic of the cord. In one instance this cord is simply braided, as in the kuna-kuna bark and the pitigua bands just described. A section of one of these bands called in Cayapa nintcū'a tañla, is shown in pl. CIII, 3. The other band, called lū'ra balya tañla, has a cord which is square in cross-section and is produced by the intricate technic shown in fig. 4 of the same plate. The head-band in each case is made in the same wicker technic in which several palma-real cords are laid side by side to form a unit warp element, and a couple of these same palma-real fibers are placed side by side to form a unit woof element.

### FANS

The Cayapa make extensively a special type of fan, called nyē've or nyiwē'wi, used for fanning the fire and 285 293 872

285 to a certain extent for fanning themselves. As is shown
293 in pl. CIV this fan is always square and has a substantial
372 handle extending from one corner. Almost the only
[824] material used for fans is the bark of the petiole of the fan-leaf palm. On rare occasions the bark of the hoja blanca is employed, and such fans almost always show a pattern in red produced by coloring one set of the twilling elements with achote. Both these materials are prepared in exactly the same manner as in making basketry.

285 The blade of the fan is always made in the over-three and under-three form of twilling, while the handle consists of a bundle of the elements which form the blade, this bundle having an outer surface of twilling or wickerwork, as shown in pl. CIII, 5–9. Such fans are usually eight or nine inches square, though they are sometimes larger and frequently smaller. The larger fans are used almost exclusively for fanning the fire, while the smaller ones are used for giving personal comfort.

285 Fans are decorated with a considerable variety of
531 geometric designs of the same character as those found on mats, and in lesser variety on twilled basketry. Pl. CV shows a number of these patterns, which in most instances are without special name and in no case are they symbolic, as has been pointed out in treating the decorative art of the Cayapa.

285 The exact manipulation of the splints used in fan-making is shown in pl. CIII, 14 and 15, which exhibit respectively the uppermost corner and the right-hand corner of the front or upper surface of the fan. In detail the manipulation is as follows: A single long

strip is bent double, always with its dark surface outward. Between the two splints which result from this doubling and at the point of the bend is passed a transverse splint with its lighter surface uppermost. Next another transverse splint is laid on top of this vertical double one, and the ends of the first transverse splint are bent over the second and passed down close to and parallel with the double vertical splint. In bending these ends from a horizontal to a vertical position they are simply turned over so that the fold in each case forms an angle of forty-five degrees with both its directions and the dark side of the splint is uppermost when the splint is given a vertical position. The third transverse splint is now laid on top of the original double vertical splint and over the two adjacent vertical splints made by bending down the ends of the first transverse splint. Next the ends of the second transverse splint are bent down over this third transverse splint. With this the first unit of three splints is obtained and the uppermost corner of the fan is made.

The next set of three transverse splints must now pass below the original double vertical splint. The first of this set passes below this double splint only. The next one passes below the double splint and the splint immediately adjacent on either side, and the third one passes under it and the two splints immediately adjacent on either side. As each succeeding horizontal splint is laid down, it is passed under and over the proper number of vertical splints required to produce the desired design. As each of these splints reaches the edges of the fan, the ends of the splint immediately preceding, which has

285 until now remained horizontal, are bent over as above described, and each of these ends forms another vertical splint passing down parallel to the original double splint used as a base in beginning the fan. Thus, while the transverse splints are all laid down with their white sides uppermost and facing the maker, when they are given this turn and pass downward at right angles to their former direction the dark side is brought into view. Hence all the transverse splints, when the fan is viewed from the side held uppermost in the weaving, are white, and all the vertical splints are dark. Thus, by causing the horizontal splints to pass in each case above or below the required number of vertical splints, the desired pattern is produced. These designs are, as above stated, always geometric, and the direction of their constituent lines is governed by the number of vertical elements crossed by the horizontal elements at the points where such direction changes.

By the addition, as above described, of as many horizontal splints as are desired, the upper half of the fan, which is a complete isosceles triangle the apex of which is a right angle, is formed. All the splints inserted in this upper half of the fan as horizontal elements become, by the above-described bending over, the vertical splints in the lower half of the fan.

When this upper half of the fan is finished, the last horizontal splint laid down is not turned over as in the case of the preceding ones. This splint marks the median line of the fan and is allowed to project horizontally out of its lateral corners until the blade of the fan is completed.

The second or lower half of the blade of the fan is 285 woven in the following manner: The horizontal element next preceding the median element was, like all the remaining horizontal elements in the upper half of the fan, folded over and brought into a vertical position. It is now given a second fold and brought again into a horizontal position. This fold is in the opposite direction to that given it above: that is to say, when a horizontal splint is given its original fold into the vertical position, the splint is folded over toward the operator, which brings the vertical portion of the element on top of the horizontal portion. When it is folded the second time and brought from the vertical again to the horizontal position, it is bent back away from the operator. This returning of the element from a vertical to a horizontal position is illustrated in pl. CIII, 15, which shows the right-hand corner of the blade of a fan. Thus each element which starts in a horizontal position and then becomes vertical in the upper half of the fan, regains its horizontal position in the lower half.

Its manipulation in the lower half of the fan is precisely the same as that in the upper half, and by the selection of the proper numbers of vertical elements over and under which it is to pass, the required design is produced in the lower half just as was done in the upper half. Each end of any given splint is bent over in the above described manner, and the two ends of any certain splint which was originally horizontal in the upper half pass back directly toward each other and together form the horizontal element in the corresponding position in the lower half of the fan. They meet along the vertical

285 middle line of this lower half, the end of each one projecting several inches out of the side of the fan. The end of one half of such a horizontal unit passes out on the front surface of the fan while the end of the other half passes out on the rear surface.

Thus, when the successive vertical elements are turned back into the horizontal position, as above described, and carried through the twilling until they reach the middle line of the lower half of the fan, there is left on each surface of the fan, when this lower triangular half is finished, a set of these projecting ends which is equal in number to that of the original horizontal elements used in making the upper half of the fan, minus one, which is the last horizontal element inserted. This, it will be remembered, was not turned down to form a vertical element as were the others. On each surface these ends project alternately toward the right and toward the left. Those on the front of the fan have their white surfaces uppermost; those on the rear have their dark surfaces uppermost, and it is from these two sets of projecting ends that the handle is woven. In the upper half of the fan, the original double vertical splint is kept as a unit, its two parts passing together above or below the transverse elements as if they were one. On the completion of the first half of the fan, however, these two are divided, one being passed down the front, the other down the back. These two now become the centers upon which the two sides of the handle are woven.

Taking first one side and then the other of the fan, the handle is woven in the following manner (fig. 24):

The uppermost projecting end of the set of horizontal elements, that is, the one at the geometric center of the fan, is first bent directly back upon itself so that it projects in the same direction as the one immediately below, which in turn is bent back upon itself so that it projects in the opposite direction. As each of these splints is bent over, one of the halves of the original

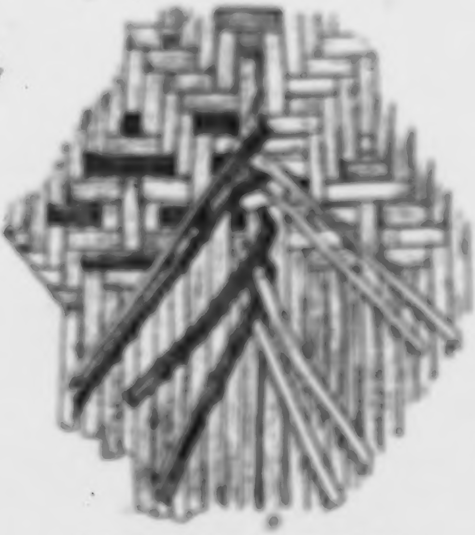

FIG. 24.—Details of fan technic

vertical element is included in the fold. The first end is next bent directly downward in the same manner as were the ends of the splints along the sides of the fan. The third end is then bent over so as to include the single strip of the original vertical element and the end which has just been bent down as above described. The end of the second element is then bent down into a vertical

E85 position and the end of the fourth is bent across the three vertical elements of the handle thus far produced. The end of the third horizontal element is now bent down into the vertical position and across the fourth which was bent over as just described. Next the fifth horizontal element is bent across the bundle of vertical elements so far produced, and the fourth is now bent down across this fifth and into the vertical position. This process of bending first one element and then another into the horizontal and later into the vertical positions as above described continues until the lower point of the body of the fan is reached. By this time the ends of all the elements which were formerly projecting horizontally along the middle line of the lower half of the fan are bent into a vertical position and form a large bundle of splints, which constitutes this section of half the handle. These are now tied securely to prevent them from loosening. The fan is then turned over and the other half of the handle is made in the same manner by means of the ends of the horizontal splints which project on the other side of the blade of the fan. Having now completed the weaving, or plaiting, as it may more properly be called, of the two halves of the handle from the center of the blade of the fan down to its lowest point, the stem of the handle, or the part projecting below the lowest point of the blade, is made. Ordinarily the end of one of the last of these elements used in making the portion of the handle above described is wrapped several times tightly around the bundle of vertical splints above mentioned. This is usually an element that projects on the side of the fan which has

**3: Barrett E-5 (1908-1909)1925**
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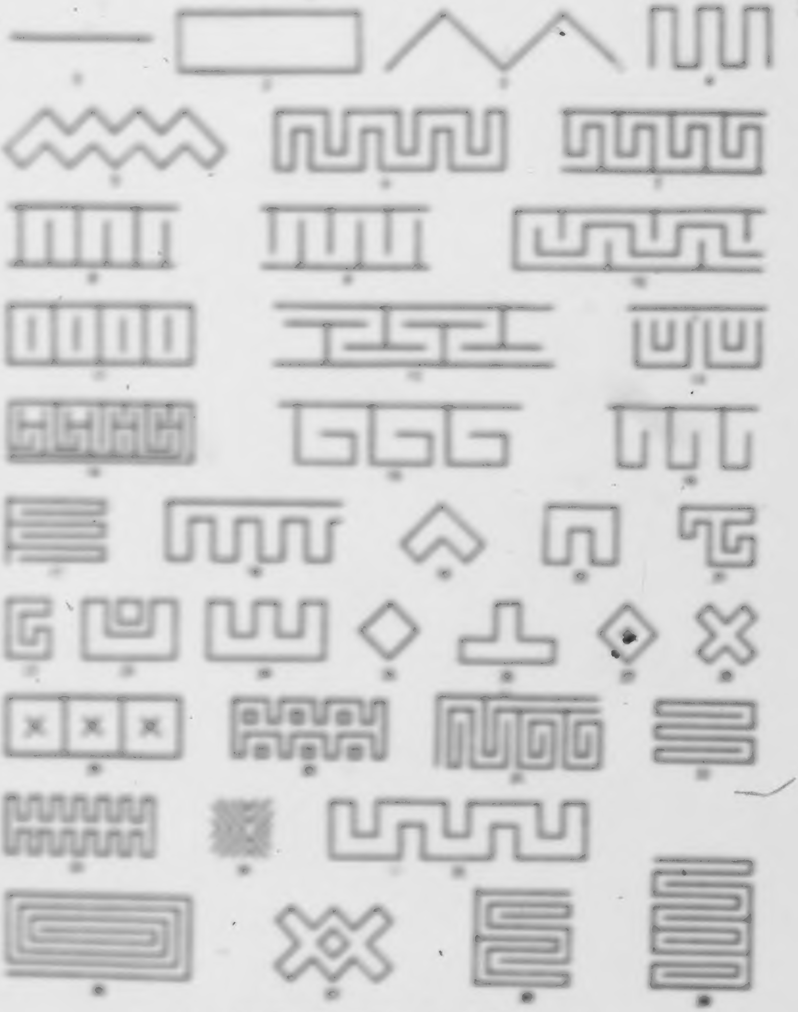
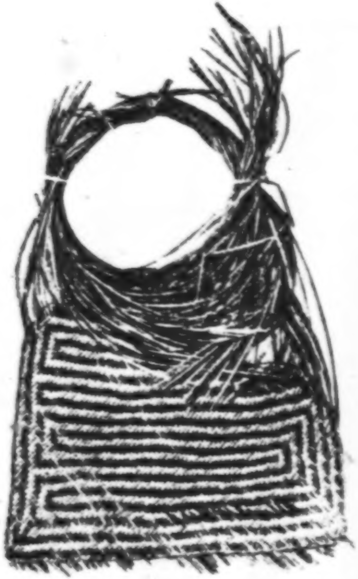


MAT AND FAN DESIGNS

[p. 246 (a)]

[p. 246(B)]



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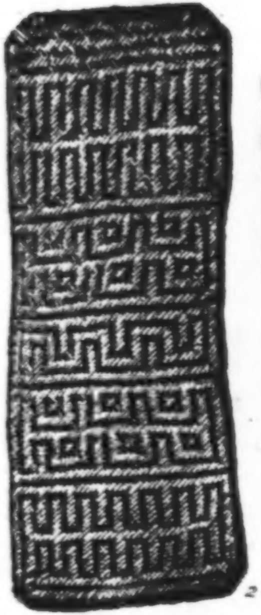

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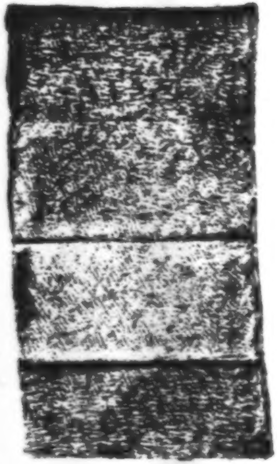

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MATS AND BARK CLOTH

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3: Barrett E-5 (1908-1909) 1925
SD 6 Cayapa SD6

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been held uppermost in the weaving of the square blade itself. After this binding certain of the vertical splints are selected and the rest of the surface of the handle is covered by the ordinary twilling process or by wickerwork. In this a single splint is passed spirally round and round the handle, the requisite vertical splints being passed above or below this spiral in order to produce the desired design. In order to hold firmly the weaving at the end of the handle, those vertical splints used as the warp elements in the twilling or wickerwork of the outer surface are bent over and passed up along the surface of the handle. This is done before the handle is completely woven to its end, each of the doubled splints being used as a single element. The last turn of the spiral above mentioned passes through the folds of these vertical splints which are then pulled tightly so as to hold it and the remainder of the weaving firmly in place. This method of finishing the end of the handle by means of bending over the vertical splints is exactly the same as that employed in finishing the borders of all baskets of the wicker technic. Examples of these handles are shown in pl. CIII, 5-9. The last four are finished in twilling, while the first is in the wicker technic.

On completing the blade of the fan, and usually before the handle is woven, the last inserted or medial horizontal splint, which, it will be remembered, was left to project out of the corners of the fan, is turned directly over and passed back along itself. If this splint were simply bent over it would bring its dark surface uppermost and would cover a portion of the white surface of

285 this middle horizontal line. However, a half-twist is given this element so as to bring its light-colored surface uppermost, as is shown in pl. CIII, 15. It is then passed on along itself and follows the same course it did originally, passing under and over the same vertical elements and thus maintaining the symmetry of the pattern. The ends of these returning sections are cut off, so that they are hidden under some of the transverse elements under which they pass and thus the smoothness of the finished surface is not interrupted by the appearance of the ragged ends of these elements.

## MATS

Mats, called tya'pū, regardless of size and use, are made of the bark of the petiole of the fan-leaf palm, and are of the ordinary over-three and under-three twilling. [531] Their designs are identical with those found on fans, although they are not so varied as the fan designs.

As is done in beginning a hamper-shape basket (page 202), one of these mats is commenced by laying down two sets of splints and crossing them along a line which gives the desired width of the mat. This line is ordinarily a short distance from what is intended to be one end of the finished mat. A short section of each long splint lies on one side of this line, while the greater part of it extends outward in the opposite direction. After having woven a few courses under and over three, the one end of the mat is finished off. This is done by taking the short ends of the elements and weaving them to the point desired as the edge of the mat, where one set of

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the elements is turned at right angles to its former course and passed in and out for a short distance along the same course taken by the other set of elements. This other set simply projects from the edge of the mat and is later cut off. An unfinished mat is shown in pl. CVI, 1. This shows the method of finishing off the first end and also of weaving a section of the body of the mat. Owing to the extreme length of the elements used in this mat it was necessary to coil them up in order to reduce the size of the object for shipment. As the mat is being woven these two sets of elements project out at right angles to each other in the form of a large V. In the case of such a large mat the elements used are often as much as fifteen or sixteen feet in length.

In weaving a mat, half of the elements, that is, all those passing in a given direction, have their light-colored surfaces turned upward; the other half, those passing in the opposite direction, have their dark surfaces upward. Now, in making the edge of the end of a mat, if the elements of the set whose light surfaces are uppermost are chosen as the ones to be turned and passed back as the binding, this turn brings the dark surface of each of these elements upward. These dark surfaces, therefore, superimpose themselves upon the dark surfaces of the elements of the other set along which they lie, since these short ends are passed over three and under three along exactly the same course as that taken by the set of elements which originally ran in the opposite direction. The same pattern is thus maintained. Ordinarily these short ends are run back over two courses of transverse splints, or a distance equal to the width

3: Barrett E-5 (1908-1909) 1925

SD 6 Cayapa SD6

285 of twelve splints. They are cut off at their point of emergence from under the second transverse course. The splints of the other set, which, in the case above mentioned, are those which have their dark surfaces uppermost, are simply cut off at the edge of the end of the mat. Thus a smooth and solid end is produced.

In most cases the weaving is not carried to its fullest possible extent at the corners, but the elements which project out from each corner are turned back upon themselves and are passed back for the binding of the corner. They pass in the same direction which they originally had in the twilling, but are on the opposite surface of the mat. This gives the mat the appearance of having its corners cut off instead of giving it a sharp right-angled corner such as would be produced if the weaving had been continued to its fullest extent.

Each one of the long elements passes diagonally across the body of the mat and on reaching the edge of its side is folded over and passes back at right angles to its former course. It thus serves as an element of the other color and passes in the direction opposite to that which it had originally. When it reaches the edge of this opposite side it is again folded over. This brings its original color uppermost, and it takes a course parallel to that which it first had and at right angles to its immediately preceding course across the mat. Thus, in a very long mat such an element may go diagonally across three or even four times, as is the case in the large mat shown in pl. cvi, 2. On arriving at the opposite end of the mat, one set of these elements is turned under and passed back to form the edge at this point, and the

ends of all the elements are cut off in the same manner 285
as was done in making the end with which the mat was
begun.

Mats of this kind are most frequently used by the 285
Cayapa in the hammocks which serve as cradles. A 352
small mat is placed crosswise in the hammock and [854]
holds its edges apart; the baby is then laid upon this
mat and swung in the hammock as a cradle. Large [287]
mats are occasionally used as beds, but for this purpose
bark cloth is preferred. An important use for mats [257]
also is as a drying surface upon which to spread cacao.
In canoeing, a large mat serves as a canopy or sun 285
covering for small children or for an invalid. If its 501
ends are placed just inside the gunwales of the canoe,
bow upward, a mat forms a convenient and very serviceable
canopy by virtue of its natural stiffness. An
instance of such a use is shown in pl. LXXX.

### SPINNING

As was mentioned in speaking of agricultural products, 248
the Cayapa raise considerable quantities of cotton, that is to say, all the cotton needed for weaving the cloth used for their mantas and clouts and for the belts used to hold the mantas in place. No one family raises any considerable number of plants, since a single plant produces almost continuously the year round and aggregates in the course of a year a considerable quantity of bolls. These plants are grown in any convenient place near the house or on the edge of a field of cane or of a grove of chocolate trees.

248 The cotton ordinarily grown in this section is of a brownish color, and it is claimed by the Cayapa that this is indigenous. It must be said, however, that brown cotton rarely grows wild along the river or in the mountains, but is seen almost exclusively about inhabited places or the sites of recently abandoned habitations.

The second variety of cotton is pure white and is also grown by the Cayapa to a limited extent. It is main-
[177] tained that this is not a native plant, but is a direct importation from the mountain region or from the Rio
[439] Esmeraldas territory. In fact, this white cotton is now sometimes purchased by the Cayapa in their trips to the Rio Esmeraldas, because so little of it is grown along their own river.

When the cotton bolls open and the seeds with their covering of fine fibers are almost ready to drop, they are gathered and, if necessary, dried. The contents of two of these fully opened bolls are shown in pl. CVII, 11. It is frequently desirable to store the cotton away in this
[488] form for some time, in which event a considerable number of the bolls are made up into a package which is wrapped with a leaf or two of hoja blanca. Such a bundle is usually tied with a piece of pitigua and in this form may be stored for an indefinite period. In the bundle shown in pl. CVII, 12, a section of the wrapping has been torn
[illegible] away in order to show the contents. When it is desired to prepare the cotton for use, the bolls are cleaned of the seeds and of any foreign matter that may have become mixed with the fibers, since the presence of any foreign substance interferes materially with spinning. In this

3: Barrett E-5 (1908-1909)1925
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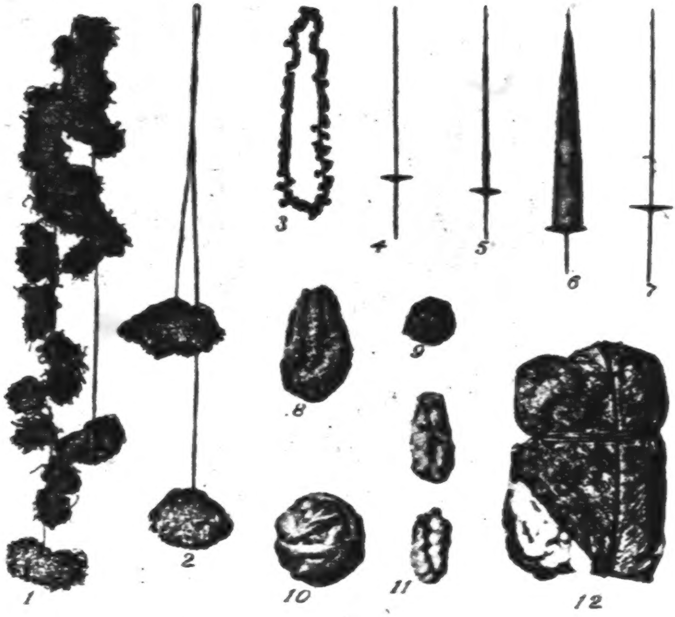
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GIRDLES. FILLET. AND SPINNING MATERIALS

[p. 252 (A)]

3: Barrett E-5 (1908-1909) 1925

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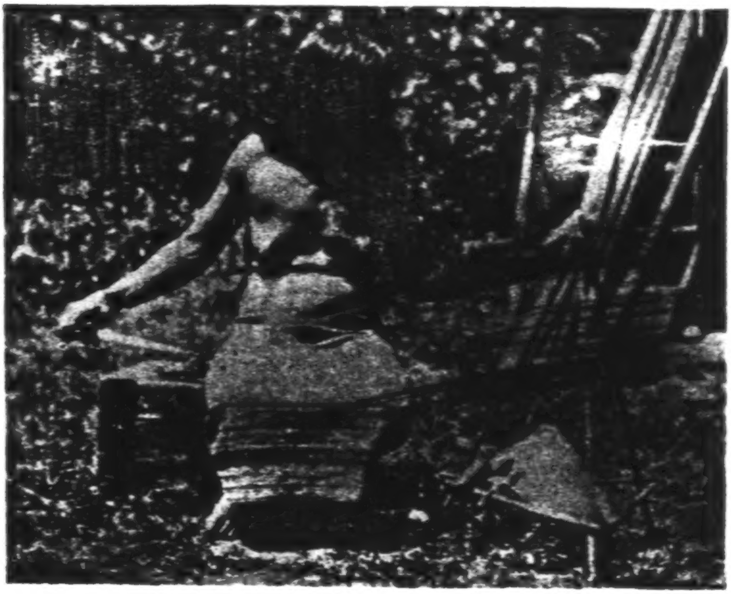

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SPINNING (1) AND WINDING (2) COTTON THREAD

[p. 252 B]

cleaning process the fibers attached to a single seed may be disengaged from all the rest and flattened into a small, irregular, and very thin layer. These bits are later placed together and their edges overlapped in such manner as to form a very thin sheet of perhaps three by six inches. On the other hand, the contents of a single boll, comprising perhaps from a dozen to twenty seeds, may be separated together, in which case the resultant sheet of cotton is of about the same size as that mentioned.

These thin sheets are next laid away until a sufficient number is accumulated to make a roll. Each sheet is then worked over a second time to insure the absence of any particle of foreign substance. In this process each sheet is worked until it is so thin as to be transparent. The sheets also become very much larger, reaching usually about ten by fifteen inches in size. They are then carefully laid one upon another and pressed firmly together with the hands, care being taken that all parts adhere. The thickness of such a mat or wadding is about half an inch. This is then rolled crosswise into a cylinder about ten inches in length and from two to four inches in diameter. The cotton is now ready for spinning and is bound by one end of the roll to the top of a tripod spinning stand, called kō *te*′le (pl. CVIII), or to a vertical pole if such a stand is not available.

Spinning is done upon a spindle (pl. CVII, 4–7), called kūtcū′a. It consists of a long, very slender shaft, called pī˙tya′lyī, of palm-wood, and a discoidal whorl called pī′′pōka, of coconut shell or of hard wood, and

3: Barrett E-5 (1908-1909) 1925
SD 6 Cayapa SD6

283 usually an inch and a half to two inches in diameter. The shaft itself is from ten to fourteen inches in length, but is usually no thicker than a large knitting needle. The spindle-whorl is ordinarily at a point about two or three inches from the lower end of the shaft, and it is this portion which is twirled by the thumb and fingers of the right hand. The thread is spun upon the longer end of the shaft. Frequently a piece of spun thread is wound tightly about the middle portion of this longer end of the shaft, as is shown in pl. CVII, 7. This is done in order to insure a firm hold for the thread during the spinning process.

The fibers of cotton always feed into the thread from the bottom of the roll, and in commencing to spin from a new roll a few fibers are worked from the outer lower corner of the sheet of cotton which forms the roll and are attached by pressure to the thread which is wound tightly onto the spindle shaft as above mentioned. As a result of the rotary motion of the spindle, these fibers are twisted together to form the thread, and, as they twist, the pulling of the spindle away from the roll of cotton causes other fibers to feed into the thread.

Having in this way started a few inches of the thread, it is manipulated with the left hand in such manner as to produce an even thickness by allowing it to pass between the first and second fingers which are made to exert a slight tension upon it, and by rolling it between the thumb and third finger in such a way that these combined actions pull where the thread is thick and allow it to pass freely through the fingers where it is thin. It is thus brought to a uniform size. This passing of the thread between the first and second fingers serves also to prevent the fibers from feeding too rapidly, since a sufficient tension is kept upon them to regulate the amount of cotton which passes on to the rolling and final forming of the thread between the thumb and third finger, where it is reduced to its final and uniform size. Now and then an exceptionally thick place appears in the thread as it is formed, owing to an irregularity in the tension exerted by the first and second fingers or to some irregularity in the rolling between the thumb and third finger. In such a case the twirling is stopped, the left hand is slipped farther back on the forming thread, and the thick portion is rolled and pulled out until it is of the proper thinness. In pl. CVIII are shown two stages in the process of spinning. In fig. 1 the position of the hands during the actual twirling of the spindle and the regulating of the forming thread are shown. In fig. 2 the spinner is shown winding a section of finished thread on the spindle.

The twirling of the spindle is done with the right hand and in one of two ways: It may be twirled with the thumb and third finger, a notch formed by the ends of the first and second fingers being used as a support for the spindle; or it may be twirled with the thumb and first finger, in which case a notch formed by the ends of the second and third fingers is used as a support. In either case the thumb is held stationary and the rotary motion of the spindle is produced by rolling the first or end joint of the opposing finger against the ball of the thumb. In this manner a rapid rotary motion is given the spindle, which process, aided by the slow feeding

283 in of the fibers with the left hand, causes a fine and tightly twisted thread to be formed.

As the fibers are fed into the thread and it gradually lengthens, the right arm is extended farther and farther from the body and the spindle moves farther and farther away from the roll of cotton. At last, having reached a point where it becomes inconvenient to rotate the spindle, the motion is stopped, the angle between the thread and the spindle is changed so that the thread is nearly at a right angle to it, and the thread is unwound for a few turns, since in spinning it naturally winds out to the extreme point of the upper end of the spindle. The motion is now reversed and the full length of the thread to the point of completion is wound on the spindle, thus bringing the left hand again near the point of the spindle and permitting another section of thread to be fed to it. In winding the finished thread on the spindle the worker begins near the spindle whorl and winds it gradually upward along the shaft. In this manner the wound portion of the shaft gradually increases and approaches the point so that, when the spindle is full, a cone of thread with a base equal to the diameter of the whorl and a length equal to the full length of this portion of the shaft is formed.

In case it is necessary to discontinue spinning, the thread is simply disconnected from the roll of cotton by pulling loose the fibers at the point where the twist in the thread is complete. This leaves a small tuft of projecting untwisted fibers on the end of the thread. To resume spinning, it is necessary only to place these loose fibers on the roll of cotton and give them a slight twist.

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

As above mentioned, the fibers are fed into the thread from the bottom edge of the roll of cotton, which feeds the fibers evenly from one end of the sheet to the other. Thus, by beginning at the outer corner of the lower edge of the sheet and feeding the fibers evenly into the thread as they come from along the line of the coil made by this lower edge, the opposite end of this edge is reached. This point is at the center of the bottom surface of the roll of cotton, and when it is reached the direction of the pull of the thread is reversed so that it follows this coil back to the outer surface of the roll where its direction is again reversed and the original path is followed to the center of the coil. In this manner the fibers are not drawn from one side more than from another, hence the roll of cotton remains constantly cylindrical and is simply shortened evenly until completely exhausted. 283

Having thus filled a spindle, it is usually placed in one of the long spindle baskets (pl. XCIII, 8, 12) until such time as several spindles have been filled and it is desired to wind the thread into balls. Such a ball is illustrated in pl. CVII, 10. [415]

In order that the thread may unwind readily from the spindle, this is held between the great and second toe of each foot. The short portion of the spindle shaft below the whorl is usually placed between the toes of the left foot, the opposite end of the shaft resting between the toes of the right foot. In this manner a reel is formed and the thread unwinds easily.

Thread is almost always stored in balls. The white and the brown thread is usually kept in balls from three to five inches in diameter. The green and the lavender

283 thread may also be wound into large balls, but because
much smaller quantities of these colors are used the balls
[439] are usually smaller. Likewise the red and the blue
woolen thread, which is obtained by trade through
Indians of the interior mountain region, comes in balls
an inch or two in diameter, such as the ball of red woolen
yarn shown in pl. CVII, 9.

283 Threads of four native colors are used by the Cayapa.
386 Two of these, the white and the brown, are the natural
colors of the two species of cotton. The lavender is
made by dyeing with a pigment obtained from a univalve
procured at the ocean, while the green is produced by a dye
obtained from the leaf of a small shrub resembling the
[439] locust of the temperature zone. In addition to these
native colors the red and blue woolen threads obtained
through trade with the Indians of the interior are used.
In dyeing the cotton either lavender or green it is wound
into short skeins, the winding being usually done upon
the great toe of one foot and the thumb of the left hand
as turning points. Another method is to drive two
wooden pegs into a section of plantain or other succulent
stem and wind upon these. The skein thus formed is
tied at the two ends near the pegs to prevent it from
becoming tangled. It is then slipped off the pegs and
placed in the dye, and by rubbing and thoroughly working
the dye into the skein, an even as well as a fast color
is finally obtained. The skeins are then laid out to dry
and are later wound into balls and stored away. Pl.
CVII, 8, shows one of these skeins after the dyeing is
completed.

Dyes of only two other colors are used by the Cayapa.

One is a jet black obtained by boiling the bark of a certain tree, and is used almost exclusively in the dyeing of old mantas or other pieces of cloth. The other is the red obtained from the achote and is used on rare occasions for coloring the material used in certain baskets and fans. 283 386

### WEAVING

Weaving is always done upon a crude, though fairly elaborate, loom consisting of twelve essential parts. In pl. CIX is shown a photograph of one of these looms as it appeared in use in a Cayapa house. This shows the parts of the loom to fair advantage, but they are even more clearly shown in pl. CX. These parts are as follow: 286

Lateral uprights, *a*, *b* = a′ipala
Cross-bars of frame, *c*, *d* = tyūnlū′ra
Warp guides, *e*, *f* = ya′ipe
Weaving batten, *g* = tsē′hwa
Shuttle, *h* = pī′picalyī
Warp separators, *i*, *j* = yade′mbū
Head bar, *k* = yade′mbū
Head stick to which the initial line of weaving is fastened, *l*
Width gauge, *m* = ityu′lya

The lateral uprights (*a*, *b*) are two long and comparatively slender poles. One end of each is forked, and each point of the fork is sharpened to a chisel edge. The points of each of these poles are forced through one of the narrow cracks in the palmwood floor of the house and across one of the joists below. The upper end of the pole is bound securely to one of the beams of the house,

3: Barrett E-5 (1908-1909) 1925
SD 6 Cayapa SD6

usually near the eaves. The foot of the pole is placed far enough from this beam so that when it is bound to the beam it forms an angle of about fifteen degrees with the perpendicular, thus carrying the upper part of the loom at a slight slant away from the weaver.

A heavy horizontal bar (*d*), usually about three inches in diameter, is next bound to the upright lateral poles at a distance of from three to six inches from the floor, and a similar bar (*c*) is bound farther up the poles, its position depending on the desired length of the cloth to be woven. It is always placed at a distance above the lower bar about six or eight inches greater than half the length of the piece of cloth to be made; thus for weaving an ordinary manta the bars are placed about three and a half feet apart. Both bars are fastened to the poles with heavy pita cords, those holding the upper cross-bar being simply bound around the pole, and those holding the lower bar being tied in through the forks at the bottom of the poles. The upper bar hangs down automatically, but the lower one is brought into place by means of two stout pita cords which pass round both transverse bars. Such cords are employed also to hold the movable bars (*i*, *j*) used as warp separators. Especially is this the case when the loom is being set up and before the warp threads are wound on it. These two cords hold the cross-bars in position by crossing, and are so placed that they are near either edge of the manta as it is being woven. The two uprights (*a*, *b*) and the two heavy transverse bars (*c*, *d*) are what may be termed the fixed elements of the loom, forming a rectangular framework upon which the warp is strung and the weaving done with what may be called the movable elements.

**3: Barrett E-5 (1908-1909)1925**
**SD 6 Cayapa SD6**

286

LOOM

[p. 260 (n)]

3: Barrett E-5 (1908-1909)1925

SD6 Cayapa SD6

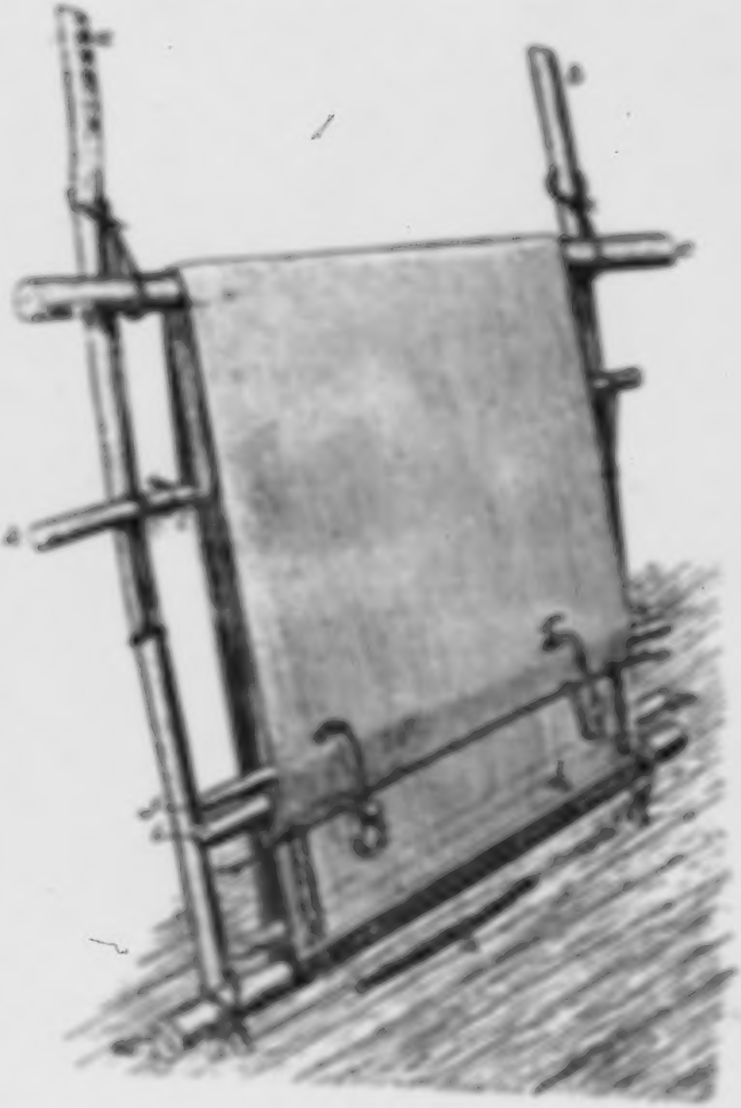


DIAGRAM OF LOOM

[p.260(a)]

These active, movable elements are the two warp separators (*i*, *j*), the two warp guides (*e*, *f*), the shuttle (*h*), and the batten (*g*). The warp separators are fairly small transverse wooden bars, one usually somewhat smaller than the other, used in bringing to the front certain sets of warp strands as the weaving progresses. In certain cases where relatively simple designs are used, only one of these bars is required—the larger of the two is then employed. The warp guide (*e*) is employed in a similar manner; in fact this element consists chiefly of a long and fine pita string, which passes in and out of the warp strands and includes in its folds each alternate strand. As it comes to the front it passes round two flexible pitigua rods and thus forms a continuous line across the unwoven portion of the textile and serves, by virtue of the fact that in its folds are included each alternate warp strand, to bring to the front, as the pitigua rods are pulled outward, the warp strands which were at the rear when the shuttle was last passed through between the two sets of warp. On the other hand, since the horizontal rod *i* passes between these two sets of warp strands and has in front of it the set not included within the folds of the long string which forms *e*, the two work in opposition to each other, so that, when the warp strands controlled by *e* are brought forward, they may be again forced backward by rolling *i* down toward *e* sufficiently to carry back those controlled by *e* and bring forward those controlled by *i*. As above stated, the smaller rod *j* is not always used. When present, its function is to control certain strands of colored warp which it is desired to form into a design at regular intervals, such as an

286 alternation of small white and green squares. In mantas where such designs do not appear, the rod *j* is obviously not necessary.

While it is possible to control by such a rod as *j* the elements of a design composed of an equal number of strands at each insertion of the shuttle, and thus by a single downward movement of the rod to bring forward all the strands needed for several such lines of design, a special device, such as that at *f*, for sorting warp strands, is required in making more elaborate designs such as bird and animal forms and many geometric figures where varying numbers of warp strands are needed in different portions of the pattern. Such a device consists of loops of pita string, each including one of the colored warp strands used in making the particular set of designs under consideration. Having first manipulated the two portions of the warp in the general way provided for by the continuous string *e* and by the horizontal rods *i* and *j*, those particular warp strands used in making each one of the lines of especially elaborated designs must next be manipulated by a set of string loops such as those at *f*. This becomes simply a process of counting out the number of strands required for the particular part of the design in hand, this number varying as each different part of the bird, animal, or other pattern is reached. Having counted out and separated the loops containing the particular strands which it is desired to show at the front of the cloth, these loops are shoved down against *e*, the remainder being forced upward in order that they shall not interfere with the others when the two sets of strands are separated, which is done by simply pulling upon those loops which contain the particular 286 warp strands which it is desired to bring forward. When these are brought forward the weaving batten is passed behind them and the whole set of warp strands is properly separated and ready to receive the woof. This is accomplished by passing the shuttle through below the weaving batten, which is placed with its edges horizontally in order to separate the two sets of warp strands.

In threading up the loom, the warp threads are fastened to a thin, narrow, palm-wood rod (*l*). A heavier rod (*k*), on either side of which one-half of the warp strands pass, is fastened by means of loops to *a* and *b*, and bears the strain of the weaving as the batten is brought down with considerable force in order to drive down the preceding course of woof and produce a tightly woven piece of cloth.

The only remaining movable element of the loom, except the batten and the shuttle, is the width gauge (*m*), which is used to hold the manta to an exact width. This [824] rod is made either of bamboo or of palm-wood, and is provided at either end with a single short and sharp point, which is stuck into the edge of the manta just below the line along which the weaving is being done.

The batten (*g*) is a flat piece of wood, usually about two or two and one-half inches wide, and of a length six or eight inches greater than the width of an ordinary manta, or about three and one-half feet. Its edges and point are much like those of a heavy double-edged sword, and both the edges and the point are fairly sharp, thus permitting the point to be inserted easily between the warp strands and also allowing a direct and forceful blow

286 to be struck along the full width of the textile with the
edge of the sword. These swords are always made of
286 the wood of the quende tree. This is a reddish, very hard
824 and durable wood, the surface of which is made extremely
smooth with the leaf, lya'pic haki, which is used especially
for smoothing wooden objects. The quende is a
rare wood in this region, and the battens are, on this
account and also by reason of the difficulty of their manufacture,
highly prized by the Cayapa. In fact, the
286 batten or sword is the only part of a loom which it is at
all difficult to make and which cannot be easily replaced
if broken or lost.

The shuttle is simply a cylindrical double-pointed rod of palm-wood, about half an inch in diameter and of a length slightly greater than the width of the cloth. Upon this rod is wound the weft. Beginning near the middle, the first winding is done in a space of six or seven inches along the middle of the shuttle. In passing the thread from one end to the other of this wound section, approximately a half-turn of the shuttle is made, the thread being given a complete turn about the shuttle at the end of the wound section, then being passed back with another half-turn to the opposite end of the wound section where another complete turn is given to hold it in place. So the winding proceeds back and forth from end to end of this middle section, each time the turn of the thread at the end of the section holding it from slipping. The wound section gradually increases in length until, when the shuttle is completely wound, it measures twelve or fifteen inches and forms at the middle of the shuttle a cigar-shape section from an inch to an inch and a half in diameter. Since the thread is very fine, a great length may thus be wound on a single shuttle.

In setting up a loom, the upper horizontal bar (*c*) naturally falls into its proper place, but the lower bar (*d*) must, as above mentioned, be brought to its place by two pita strings, which pass from *d* to *c* and which serve also to hold the movable rods *i* and *j*. In inserting the movable rod *i*, the string which naturally comes at the front passes back of *i* and the one which naturally comes at the back passes in front of it, thus forming a sort of double figure eight. This holds the rod *i* in position, but at the same time admits of its movement up or down as may be desired. The rod *j* is similarly held. In this condition the loom is ready for threading.

Balls of warp thread of the desired colors are selected, white or brown cotton being used as the background, and lavender, green, red, and blue for working out the designs. In every case the warp elements are those which are visible and which produce the designs, and the stringing of the warp upon the loom requires considerable care in order to get the desired colors in the proper places and to get just the right number of warp strands in any given band. In stringing the loom the threads are wound round and round the two horizontal bars, *c*, *d*. The back of the loom when threaded appears as a sheet of fine parallel threads with nothing inserted among them. The front, on the other hand, presents a very different appearance, for in this winding every other thread passes behind the movable bar *i*, while the remaining threads pass in front of it. In this way *i* divides the front sheet of threads practically into two sections of equal numbers.

286 This is not strictly the case, however, for along those lines where it is intended to work out an elaborate pattern all the colored warp strands are passed back of the bar *i*.

Having completed the threading of the loom in this manner, two pieces of the flexible pitigua are obtained, together with a ball containing a very long and fine pita string. With these the guide *e* is made. The string is passed in and out between the adjacent warp strands upon the front surface of the loom, so that the warp strands in the rear half of this front sheet, that is, those strands lying back of the transverse bar *i*, are included, *each in a separate turn of the string* as it passes back between the warp strands that lie in the forward half of this sheet and again comes to the front. Each time this string comes to the front, it is wound in and out in the shape of a figure eight over the two flexible pitigua rods, the two rods being included in the loops of the eight. This holds the string firmly along this line at the front and permits it to pass back and to include another of the rear warp strands, after which it again comes to the front and repeats this course until the entire guide (*e*) is completed. As above stated, in weaving it is necessary only to pull forward upon these two transverse pitigua rods with their attached string to bring forward all the warp strands at the rear of this front sheet or set and pull them completely through, each individual strand passing between the adjacent warp strands lying in the front part of this set. Thus the strands which were at the rear now become the front strands, and those which were at the front become the rear strands. The lateral pressure of the strands upon one another is sufficient to hold

3: Barrett E-5 (1908-1909) 1925
SD 6 Cayapa SD6

286

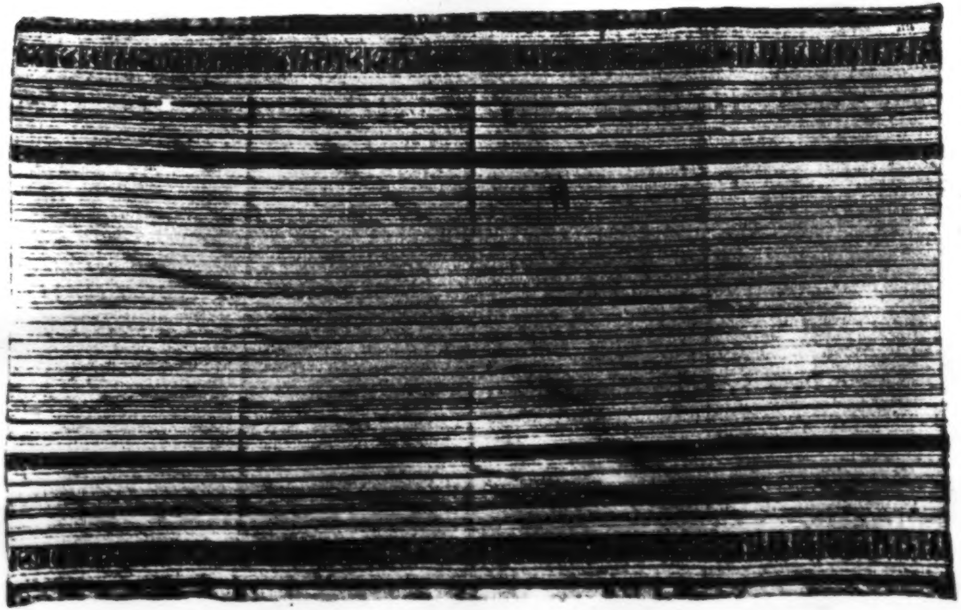
WOVEN FABRIC BEING STRETCHED

[p. 266 (A)]

286
291

3: Barrett E-5 (1908-1909) 1925
SD6 Cayapa SD6

[p.266(8)]



MANTA OR SKIRT

them in place when once they have been drawn forward, thus when it is desired to bring forward these rear strands, the transverse pitigua rods of *e* are pulled forward and the batten is inserted between what then becomes the front set of warp strands and those which are then at the rear. This sets the entire warp in the proper order for producing this certain course in all those simple designs which do not require special sorting of the warp elements.

By the use of the guide *e*, as above mentioned, the relative positions of the warp strands were reversed so that those which were originally at the rear and which passed back of the guide rod *i* are now at the front, and vice versa. Obviously, therefore, when it is desired again to reverse the relative positions of these two sets of warp strands, it is necessary only to bring the bar *i* down, which is always done with a rolling motion, thus gently forcing the strands that passed back of the bar, but which are now in front at the point where the shuttle and the batten were last inserted, again to the rear and bringing those which are now at the rear but which formerly passed over the front of the bar *i* again to the front at the point where the shuttle and batten are next to be inserted. By the use of the rod *i* and the guide *e* in this manner, it is of course possible to bring forward alternately the two sets of warp strands in a wholesale way, as they are required in the weaving.

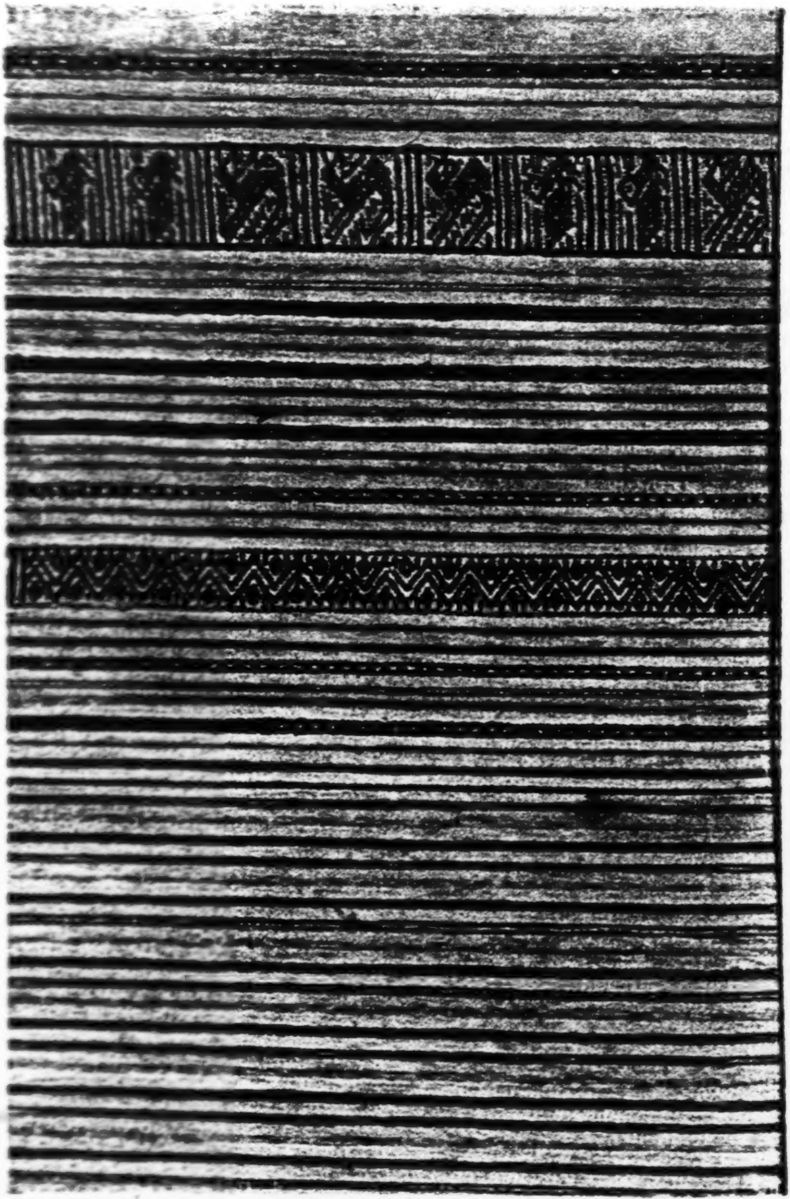
If a perfectly plain piece of cloth were woven in this manner, no devices for shifting the warp other than the two above mentioned would be necessary, since no difficulty would be encountered in the matter of designs. A fairly simple device is used in those cases where certain regular alternations only are needed. This is a smaller bar (*j*) which controls certain of those strands that pass in front of the bar *i*. This bar (*j*) has no connection with the rear set of these strands. Now, when all the strands passing in front of the bar *i* are forced to the rear by pulling the guide *e* and its set of warp elements forward, those certain strands of the set which pass in front of *i* but which are needed forward, are brought to the surface by rolling *j* down over *i* to a point where it is possible to insert the batten so as to bring these few elements to the front.

Where still more elaborate designs, such as complex geometric figures, animal and bird forms, and others, are desired, it is necessary each time to sort out by hand the special warp strands needed for the particular line of design then in hand. As above mentioned, the transverse bar *i* divides the set of warp strands into two groups approximately equal in numbers, the alternate strands passing respectively in front and behind the bar. All those colored warp strands, however, which are used for these more elaborate designs pass to the rear of bar *i*, and in order to sort these out and bring them forward as needed, a device (*f*) similar to that used in connection with the two transverse pitiguas in *e* is employed, though in this case the individual threads catching the warp strands are much longer. The threads employed in the guide *e* and which are used to bring the whole rear section of the warp to the front, are not attached to the particular strands controlled by *f*. The longer threads of *f* pass about these, and these only. Thus, after those strands which are controlled by *e* or those controlled by *i* have

3: Barrett E-5 (1908-1909) 1925
SD 6 Cayapa SD6

286
291

PL. CXIII



BARRETT—CAYAPA INDIANS

[Black and white reproduction of a color plate]

[p. 268(A)]

3: Barrett E-5 (1908-1909)1925

SD 6 Cayapa SD6

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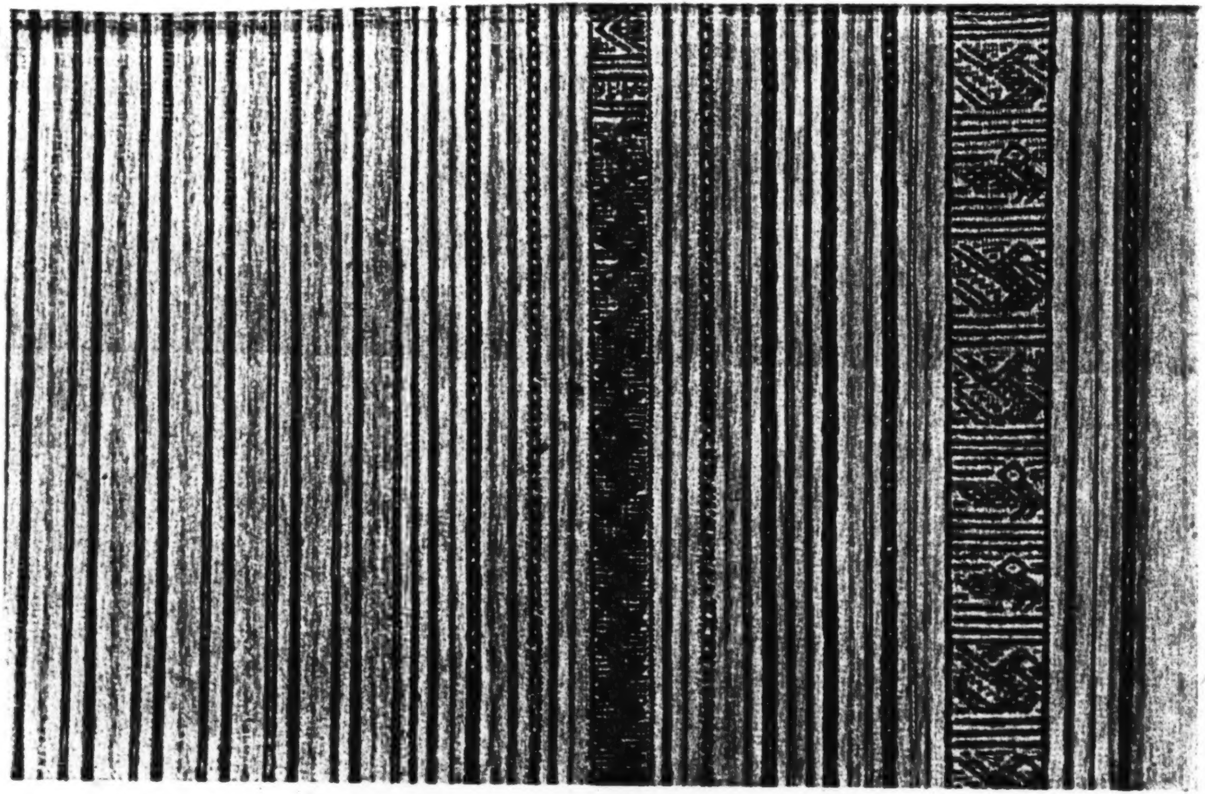


DETAIL OF MANTA PATTERN

[Black and white reproduction of a color plate]

[p. 268(B)]

286 been brought into their proper position and the warp set in a general way for the particular line of weaving in hand, the bunch of long strings comprising *f* is taken up and are sorted out. They are counted off and the ones attached to those particular warp strands which it is desired to bring to the front are passed downward, the remainder being passed upward to a distance of several inches from the former. Having arranged one after another of these sets of warp strands, and having thus set in proper order the particular strands which are to be brought to the front, the pointed end of the batten (*g*) is inserted and passed from the right toward the left. Those particular strands controlled by the strings of *f* which are needed at the front are pulled forward with the left hand as the batten is inserted. No attention need be paid to any of the remainder of the warp strands as the batten is inserted, since these are automatically controlled by *e*, *i*, and *j*.

Having thus properly inserted the batten, it is grasped at each end by one hand and is brought down several times with forceful and even blows, thus driving the warp strands, each pair of which crosses above the preceding horizontal weft element, down very closely upon it. The batten is then raised three or four inches and so turned that its flat surface lies horizontally. This spreads the two sets of warp elements apart and the shuttle is passed through between them, thus bringing another of the fine weft elements into position. This weft element is pulled very carefully into its place and given just the right tension, since any undue amount of tension upon it, or on the other hand any undue laxity, 286 would cause an unevenness at the edge of the textile, or, what would be worse, a series of these might cause a puckering or a gaping at some point in the textile body. The batten is then withdrawn and the warp elements are crossed above this new weft element, and are set in their proper positions by means of the devices *e*, *i*, *j*, and *f*, as above described, after which the batten is again inserted and brought down edgewise with its forceful blows to drive firmly the new crossing of the warp elements down upon the newly inserted weft.

From the above description it will be seen that the patterns of Cayapa soft textiles are formed entirely by the warp elements, the weft being almost entirely invisible in the properly made cloth.

There is but this one cloth technic among the Cayapa, the only approximation to a variation of this being in those designs where a diagonal line is desired, in which case there is an arrangement of the elements that approximates twilling.

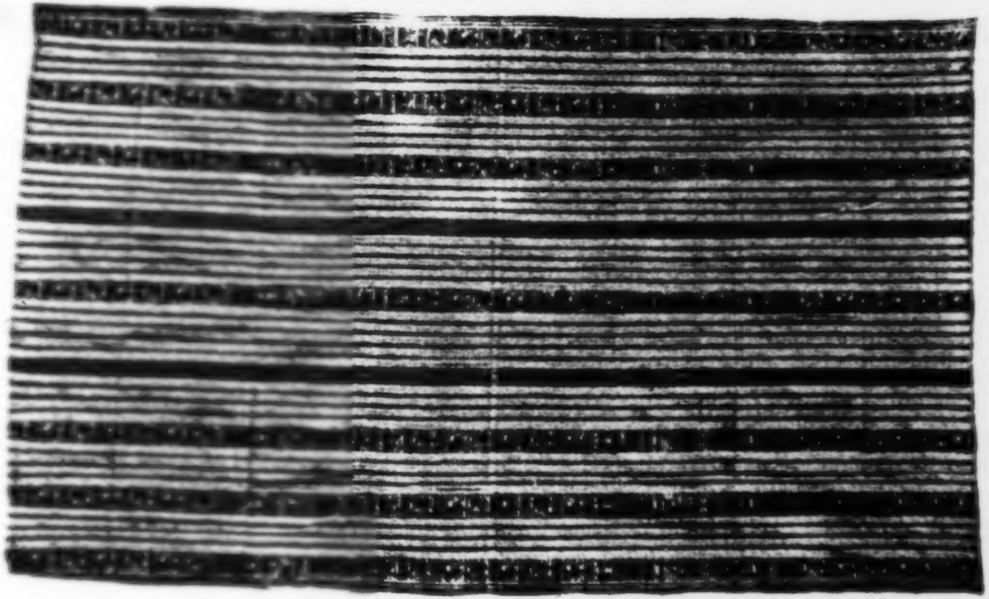
As before stated, the loom is so arranged that its lowest part is not more than four or five inches above the floor, and it is upon the lower portion of the loom that the [516] weaving itself is done. The weaver sits, tailor fashion, upon a piece of bark cloth only, or sometimes upon a very low stool, and weaves a section of cloth eight or ten inches in height, after which the lashings of the rod *k* are loosened so that the work may be slipped around as would an ordinary band upon the two transverse bars *c* and *d*, thus bringing the last line of the work down almost to the bar *d* again. Keeping the work low in this manner has a double advantage: it is easier to

PL. CXIV

3: Barrett E-5 (1908-1909)1925

SD 6 Cayapa SD6

[p. 270(A)]



MANTA OR SKIRT

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291

286 strike a forceful blow with the batten if it is struck at a point somewhat below the level of the shoulders, and it is easier to manipulate the several devices, *e*, *i*, *j*, and *f*, used for controlling the warp elements. Thus, by a series of such readjustments, the line along which the weaving is being actually done is kept uniformly low, and the labor therefore rendered as easy as possible. This continues until the proper length of the textile has been reached, when the two ends of the woven section are usually about a foot apart, the loom having been originally set up with this allowance. A narrower section of unwoven warp strands it would be impossible to have at this juncture in this particular technic, since with a narrower section there would not be sufficient room to manipulate the devices used for controlling these strands.

Having completed the weaving, two fine hard-twisted cotton or pita strings are prepared and with these the ends of the woven section are bound. This binding is done with two elements, one horizontal, passing on the front, and the other wrapping element passing spirally around the horizontal element in such manner as to include at each turn two pairs of warp strands. As it passes back it goes above the horizontal cord. It then takes a turn downward and toward the right in such a way as to include two pairs of warp elements and again comes out below the horizontal cord and on the front surface of the cloth, after which it goes up and over this horizontal cord and includes two other parts of warp elements as it again passes downward and behind the horizontal cord. By a repetition of this method the whole edge is securely bound from the left toward the

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

28 right. When this is completed the batten is again inserted and this binding firmly driven home against the last row of weaving.

The colored warp elements are now carefully selected and cut out close to the two ends of the weaving. Thus there are left only the white or brown cotton threads used as the body of the warp and the background for the pattern. These are cut about mid-way between the two ends of the weaving, thus freeing the textile from the loom.

Now and then it happens that, in the course of weaving, some of the warp or weft elements are broken, when it is necessary to tie them. The loose ends of such a tied strand naturally appear on one or the other of the surfaces of the fabric, which is now carefully inspected and such projecting ends cut off with a sharp knife.

Two small wooden rods a few inches longer than the width of the textile are next procured and the textile at each end is tied by means of the fringe of warp elements to one of the rods. There are twenty or even thirty such ties made around each of the rods. The textile is then taken to the river-bank, where four posts are driven in such manner that it may be stretched horizontally by tying the ends of the rods to the posts (pl. CXXI). The fabric is then thoroughly wet and allowed to dry in the sun, which shrinks it as much as is possible, adjusting the strands one to another and tending to reduce any stiffness in the textile.

266 When dried the fabric is taken down and the fringe
412 untied from the rods. A hemispherical calabash vessel or other rounded surface is next provided and with a

3: Barrett E-5 (1908-1909)1925
SD( Cayapa SD6

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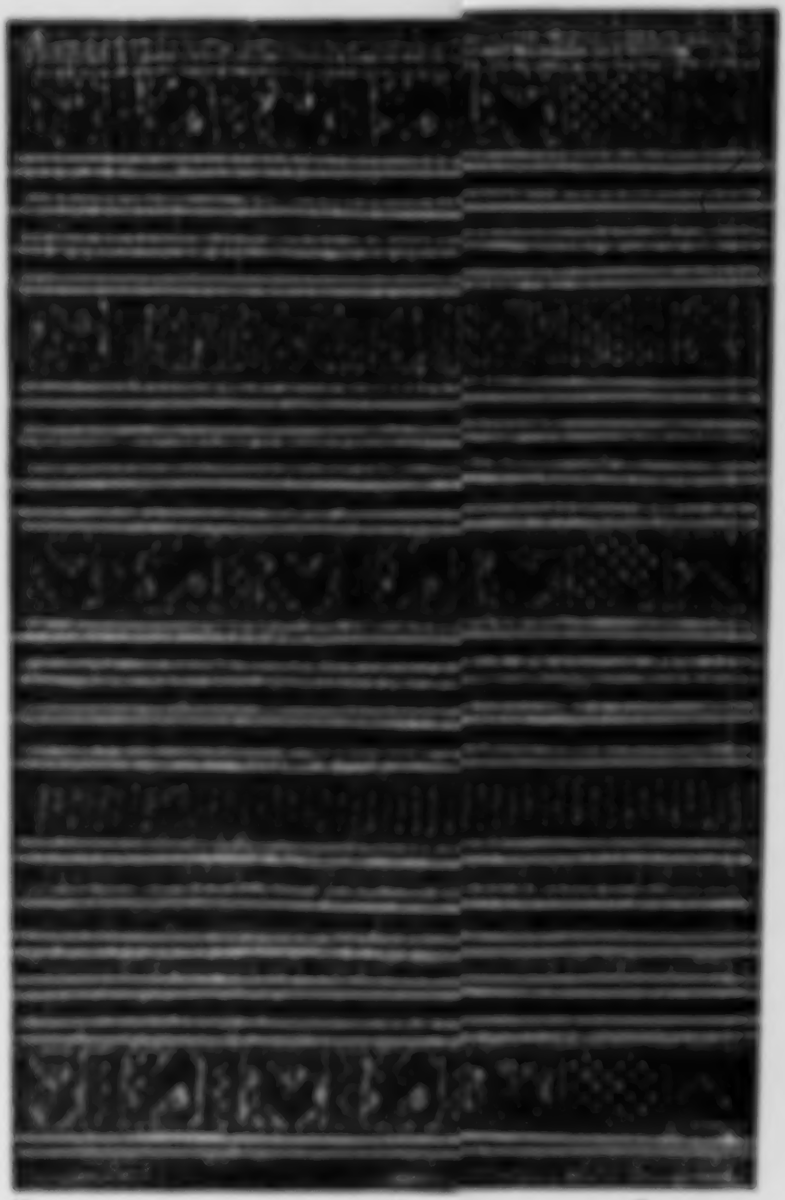

[Black and white reproduction of color plate]

[p. 272a]

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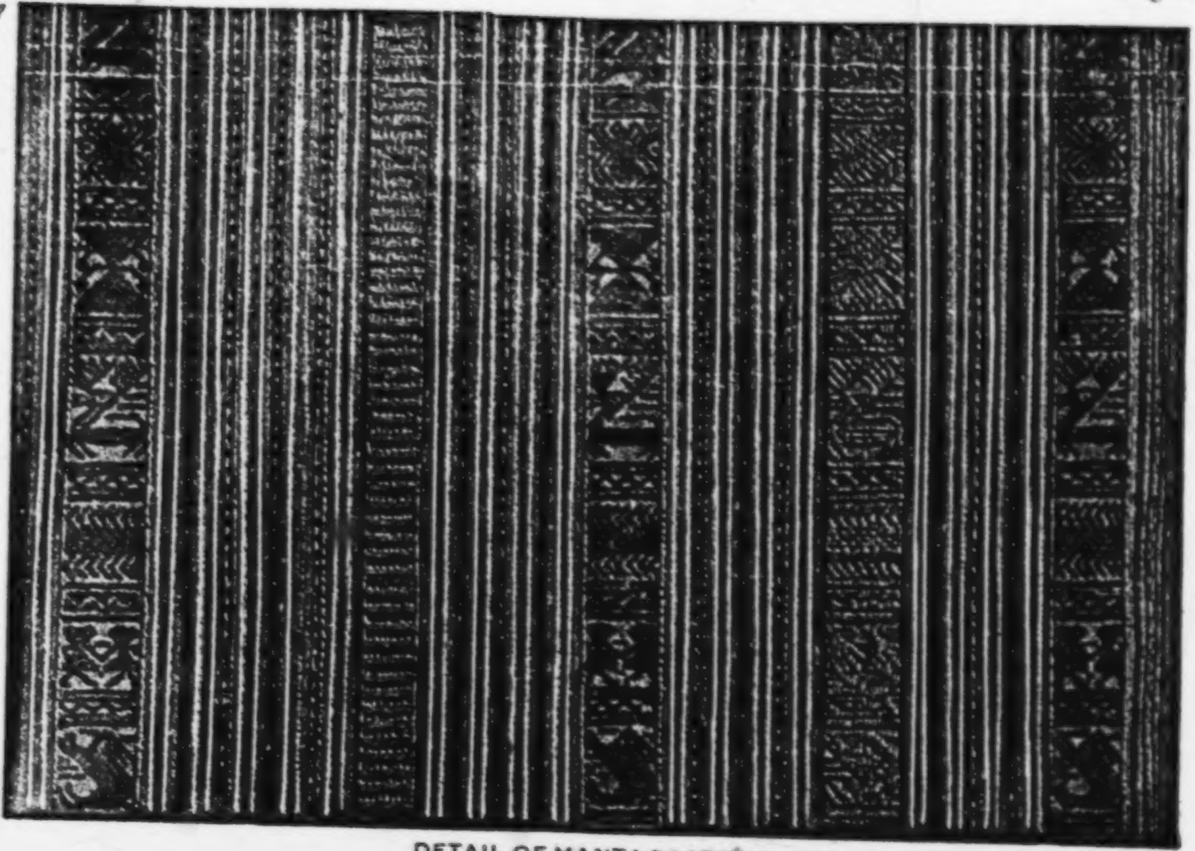

DETAIL OF MANTA PATTERN

[Black and white reproduction of a color plate]
[p. 272 (8)]

286 sharp knife the fringe, placed against the calabash, is
412 trimmed close to the binding at the edge. The fabric is now ready for use.

291 Mantas (pls. CXII–CXV), called tyũ'nya by the Cayapa,
286 used by the women as skirts, and also mochos (pl. CXVI),
294 called wa'ra, are almost the only textiles now made. No other aboriginal garments are worn except the narrow belt (pl. CVII, 1, 2) used by the women in connection with the manta. These belts are woven in precisely the same manner as are the wider textiles, except that a loom is not used unless it is desired to make a wide and elaborate belt.

286 For narrow belts two short wooden pegs are driven into a section of a plantain or other succulent stem, and upon these the warp strands of the belt are set up on the two transverse bars (*c*, *d*) of a regular loom. For a narrow belt, pita string is often used as the weft. The wide belts are often nicely decorated with geometric or bird and animal figures. For weaving a narrow belt, no shuttle or batten is used ordinarily, the string being passed in the form of a ball between the warp elements, and the finger used to drive the weaving down tightly. The ends of narrow belts are not provided with a special binding; the warp strands at each end are simply braided, usually in two sections, the braids being used for the attachment of tassels made usually of red or blue woolen yarn.

Mantas, of course, are of various sizes, governed by the age of the persons for whom intended. The manta of an adult woman usually measures about thirty by sixty inches, and requires often several months for its weaving, 286 since such weaving is done in large measure only at odd times.

The trunks or mocho (pl. CXVI) worn by the men is
[294] made of cloth woven by the women, a special narrow
fabric being produced for this purpose. One of these
pieces of cloth contains enough for two mochos. It is
always cut and sewed by the men themselves, some of
[462] them being adept with the needle. The women know
almost nothing about sewing. It ordinarily even falls
to the men to make the small mochos for the boys until
they are old enough to sew for themselves.

The subject of manta designs is treated under Decorative Art.

### CORDAGE AND NETTING

283 In most cases cordage and nets are made of the fine,
[824] long, white fibers obtained from the leaf of the plant
called in Spanish pita and in Cayapa sa'nŏ, and to a
much more limited extent the fibers from the bark of a
tree called in Spanish cosadera and in Cayapa señgi'lya
are used.

The preparation and manipulation of pita, to which
reference has been made hitherto, are quite elaborate.
The long, slender, full-grown leaves of the plant are cut off
close to the ground and brought to the house in bundles,
such as those shown leaning against the house in pl.
LXVI. While the leaf is still green the fibers are extracted by first scraping off the succulent portion of the
concave side of the leaf and then stripping out the fibers
283 from the remainder. For this scraping there are required
413 a semi-cylindrical log of palm-wood, called sañwi ci'nŏ,

3: Barrett E-5 (1908-1909)1925

SD 6 Cayapa SD6

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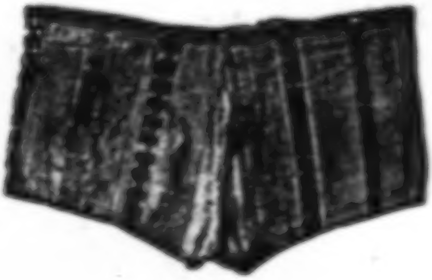

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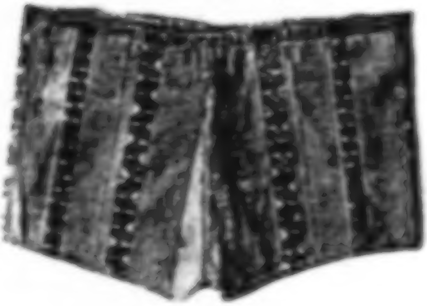

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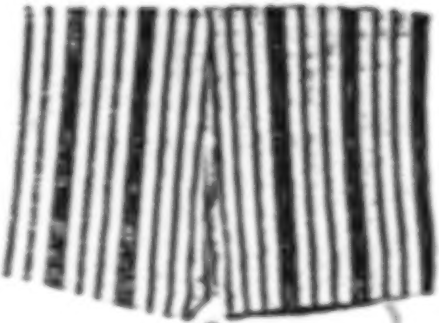

3

MOCHOS OR TRUNKS

[p.274(A)]

3: Barrett E-5 (1908-1909)1925

SD6 Cayapa SD6

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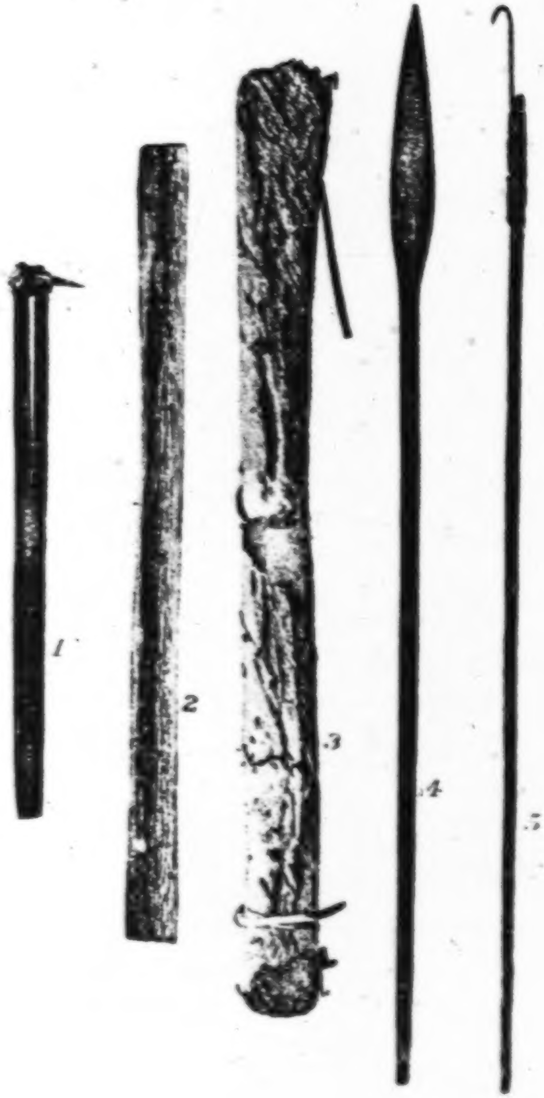

SCRAPERS, TORCH, LANCE, AND HOOK

[p.274(B)]

and a double-edged shaving knife, called sañwi′ctcīpapa. 283
The log is half of a nine or ten foot section of a trunk 413
of the pambil palm. Its flat side is leaned against 283
one of the horizontal beams that compose part of the superstructure of the house, at an angle of about twenty degrees with the perpendicular and about midway between two vertical poles the tops of which are bound to the opposite or outer surface of the beam. These poles, which are usually the forked ones used to support the loom, are placed about two feet and a half apart. At a height of six or seven feet from the floor a piece of pitigua is bound to the two poles and so placed that it passes horizontally across the curved surface of the log. A second piece of pitigua is tied horizontally and at a level also about six or seven feet from the floor, but at a distance of several feet toward the interior of the house.

The pita leaves are now sorted according to length. Six or eight leaves are then piled neatly one upon another, bottom uppermost. This bunch is bent double and passed behind the pitigua cord that runs directly across the log; the cord presses the leaves at their fold tightly against the log, holding them in place during their manipulation. The leaves are always placed so that the concave side of each is uppermost and so that at first the bases of the leaves hang down against the log. The upper half of the bunch of leaves, and also those individual leaves of the lower half which are not actually in use, are kept out of the way by being passed up over the cord above mentioned, which is stretched at some distance from the log.

Beginning now with the base ends of the leaves, the

283 lowest one in the bunch is brought down on the convex surface of the log, and with the corner of a knife the succulent outer layer is split throughout the length of the section of the leaf exposed. This allows the leaf to be easily flattened against the log so that the succulent layer may be scraped off with one of the edges of the knife (fig. 25).

283
413
[824] The knife used for this purpose is illustrated in pl. CXVII, 2. It is usually made from half of a section of wild cane (Spanish caña brava), and is ordinarily from fifteen to eighteen inches in length. The soft center of the cane is hollowed out so that only the hard, woody portion of the outside of the stalk remains. The two edges of this semi-cylindrical section are very sharp, thus producing a serviceable implement.

283 The succulent portion of the leaf having been scraped off and the fine fibers exposed to a length of eight or ten inches at the base of the leaf, the fibers are loosened with a thumb or finger nail and are then split loose as far up the leaf as the scraping has progressed by pulling them gently outward. A slit is then made in this scraped section and the loosened fibers are passed through and looped (fig. 25) in such manner as to prevent them from becoming tangled as the scraping proceeds farther up the leaf. When this half of the leaf is completely scraped, it is hung at the side of the pole and the corresponding portion of the next leaf is scraped.

Finally, all the lower halves of the leaves having been scraped, the upper halves which had been placed overhead are brought down upon the log and held in position by means of the horizontal cord which secured the lower halves. This is done by bending over a section about a foot long at the extreme tip of the bunch of leaves. The upper halves of the leaves are then scraped as described. Finally each leaf is separately reversed, the scraped por-

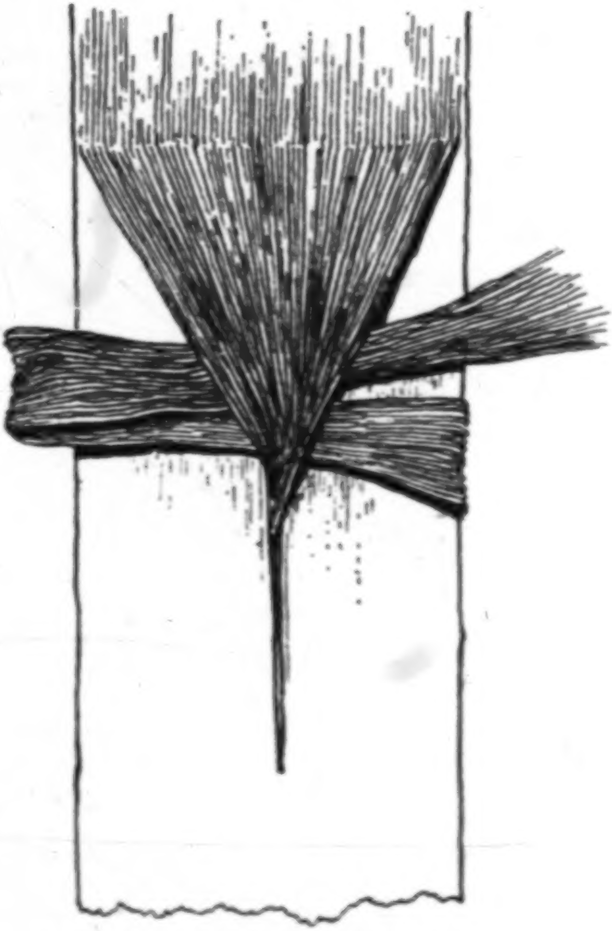

Fig. 25.—Pita fibers tied to prevent tangling

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

283 tion being passed back over the shoulder, and the last foot of the tip of the leaf is held in place upon the log with the left hand. With the knife held in the right hand, its surface is scraped the same as that of the remainder of the leaf. The leaves are then taken from the pole and the fibers carefully stripped off with the hands. The fibers from each leaf are coiled up separately and the coils are later taken to the river and thoroughly washed to remove what pulp and juice remain. The product is a set of light-green fibers which are placed in the sun to dry and bleach, and finally are combined into large bundles or skeins which are stored until needed. Such a set of fibers is first doubled and the halves are lightly twisted together, producing a long, slender skein such as that shown in pl. CXVIII, 1. This is again doubled and lightly twisted, and even a third doubling and twisting may be employed to make the skein of the desired length.

In preparing the fibers for making string, one end of a bundle of them is tied to an upright support, and the fibers of the loose end of the bundle are combed with the fingers to remove any short and useless ones and to bring the long ones parallel. These long fibers, still tied in the bundle, are then selected according to the kind of string desired, and are made into loose plies by first twisting them with the fingers and then by rolling them upon the calf of the right leg. This results in a bundle of plies such as that shown in pl. CXVIII, 2. When all of the bundle of fibers has been treated in this manner, the plies are selected in pairs and twisted together by grasping a pair of plies in the left hand so that the first finger passes

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

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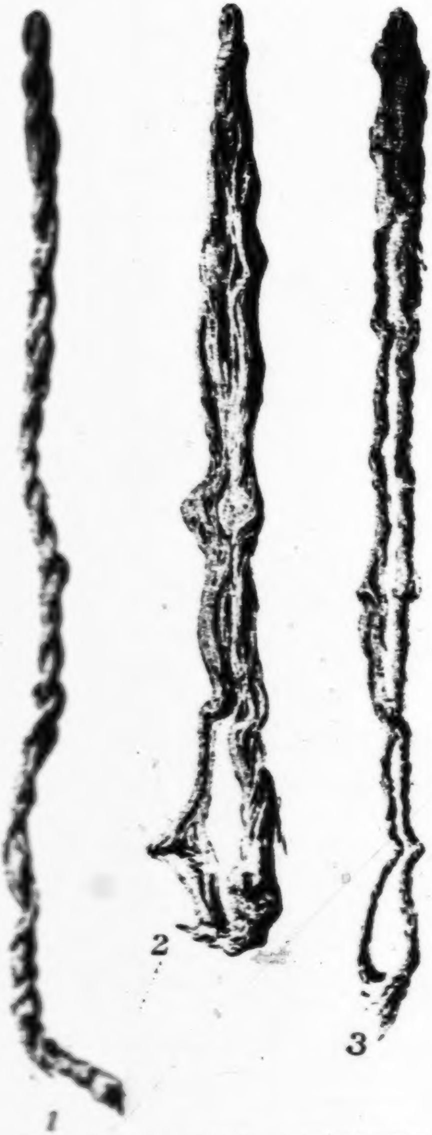

PITA FIBERS, PLIES, AND CORDS

[p. 278(1)]

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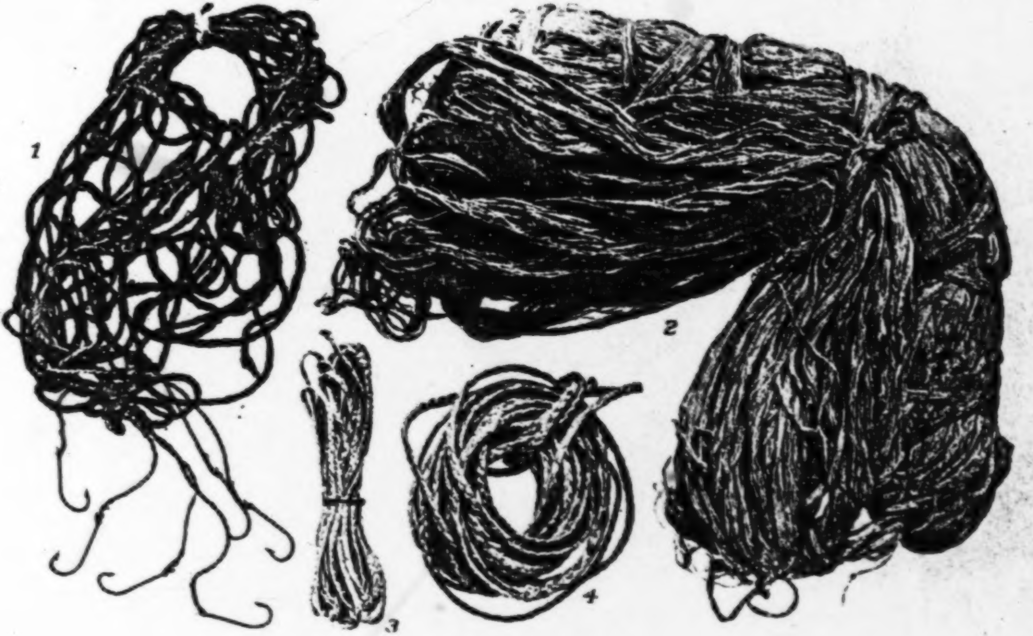
[P. 278 (b)]



TROT-LINE, BUNDLE OF PITA FIBERS, AND CORDAGE

283

between the two; they are then rolled simultaneously with the palm of the right hand upon the calf of the right leg in order to twist each separately. They naturally twist together beyond the left hand by virtue of the tortion in the separate plies, but at frequent intervals are pulled apart, since each must be thoroughly twisted separately before the two are allowed to twist themselves together to form the string. At last the finger which has been used to separate the plies is withdrawn and the rolling motion is reversed, so that the hand is drawn toward the body instead of moving from it. This reverse motion, combined with the individual tortion in each ply separately, serves to twist the two plies together in the opposite direction to that of the individual twist of each ply and to form a firm and strong string. The twisting of such a lot of plies results in a bundle, or what may be termed a skein, of cords such as that shown in pl. CXVIII, 3. All string is two-ply, its size being governed by the quantity of fiber used for each ply and by the use for which it is intended.

A large number of fibers are obtained from each leaf, and a considerable number of strings, each as long as the leaf, result from the twisting process. In one case, for example, four leaves yielded sixty-four fine cords such as are used for weaving the conical casting net. The length of each of these cords was about fifteen feet.

In twisting cords in the manner described, care is taken that they do not become tangled. Accordingly when a considerable number of cords have been twisted they are divided into three approximately equal groups which are then braided. As the work progresses and

283 several other cords are completed, these are added to the braids at the ends. Thus by adding group after group of these braids, when the whole bundle of cords is completed and both its ends are braided it forms a skein of cords which appears like that shown in pl. CXVIII, 3. The skein is kept in this form and the individual cords are extracted from its middle. This tends to pull backward and to loosen the braids at the two ends of the bundle and thus easily to free the ends of the individual cord from the braids.

[824] The other kind of string obtained from the bark of the
tree called in Spanish cosadera and in Cayapa señgi'lya,
is made in a manner similar to that employed in making
pita string. The fibers used in making this string are
obtained by beating out the bark by the method em-
ployed in making bark cloth. After being washed, as in
the case of bark cloth also, these fibers are dried, folded,
[352 and bound into bundles (pl. CXIX, 2). When needed,
227] the sheets are taken from the bundle and the fibers are
separated and twisted into a heavy and rather loose
cord which serves very well for making a hammock or
as the main cable of a trot-line (pl. CXIX, 1), but other-
wise is little used. The string bears the same Cayapa
296 name as the tree itself, and its primary use is for ham-
mocks, which are woven with the same technic as are
fish-nets, shortly to be described. The meshes are, how-
ever, extremely large and are made without the aid of a
mesh-stick, being kept sufficiently even by the eye alone.

The Cayapa do not splice cords by twisting together the fibers at their ends, as is done by some Indians. An individual pita cord is usually from ten to sixteen feet

in length and is used as a distinct unit in the weaving. 286
When the weaving has proceeded to within six or eight inches of the end of the cord, a second is simply tied to it in a square knot and thus is added a new unit of material. Hence no shuttle is required as among peoples who use a very long thread or cord. In fact the only implement 286
required in weaving is the mesh-stick, which is usually 413
of bamboo, although large ones are sometimes made of wood. It is ordinarily from five to seven inches in length and varies in width according to the size of mesh desired (fig. 26). The relatively wide ones used in weaving the large-meshed set-net are called wa'lō tcīpapa, thus differentiating this form from that known as ała'ia tcīpapa, or ate' tcīyapa, used in weaving the casting net. The general term for mesh-stick is ya' tcīpapa.

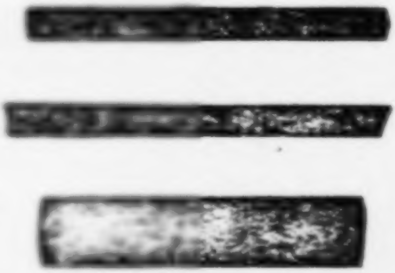


FIG. 26.—Mesh-sticks or gauges for weaving nets

In weaving one of the large set-nets, such as that 286
shown in pl. CXX, 2, and called by the Cayapa wa'kū, the required number of knots, usually five, is first tied to start the corner of one end. By adding a knot at each end, new meshes are added; and as each row of meshes is woven, the width of the net may be increased to any desired degree. This first portion of the net forms a right triangle, one side of which represents the width of the net, the other an equal length along one side of the net. The hypotenuse of the triangle is the line along

286 which the weaving is done. By weaving now evenly along this line without adding more meshes to the succeeding lines, a rectangular net of the desired length is produced. The final corner of the net is made by dropping knots and meshes in the succeeding rows of weaving: in other words, by exactly reversing the process employed in starting the original corner.

[284]

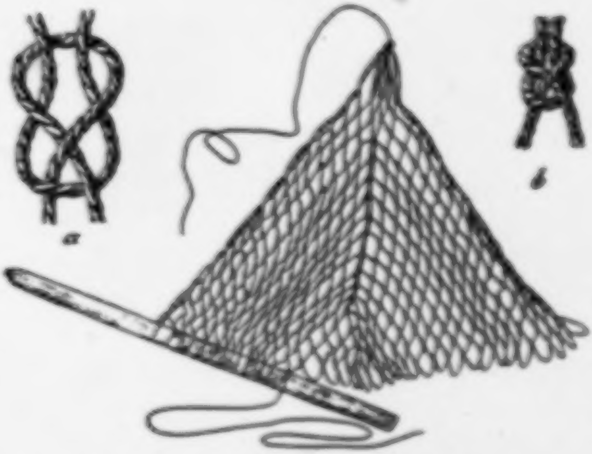


Fig. 27.—Net weaving and detail of knot

All nets are woven with the same type of knot, two
details of which are exhibited in fig. 27. In *a* is shown
one of these knots opened to a considerable extent, and
in *b* this knot is shown as it appears closed and drawn
[227] tightly in the net. The use of the mesh-stick is also
shown in the figure, which illustrates the beginning of a
conical dip-net. The technic of this net differs somewhat
from that of the set-net above described, but the knot
employed and the use of the mesh-stick are the same.

286

Starting with a series of five knots and meshes at the point, this net is widened, as in the case of that above described, by adding an extra mesh at each end of each course. In addition, an extra mesh is added at the middle of each course, thus producing a double line down the middle of the net, as shown in fig. 27. To complete the net it is necessary only to join the open edges. This produces a conical net about two feet deep from the point to the opening, which is itself about thirty-six by eighteen inches.

177
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The principle of the conical casting net, shown in pl. cxx, 1, is presumably adopted from the negroes, being made in exactly the same way as the nets manufactured by them. Furthermore, it bears the name ata'ia, clearly derived from the local Spanish term atarraya.

286

In general technic this net is similar to the set-net above described, although its point is started quite differently. First a considerable number of fine pita cords (in one instance forty were counted) are braided tightly together to form a strong loop about two inches long, into which is fastened the line by which the net is drawn in after a cast is made from the canoe. The loop must be very strong, and in order to add to its strength it is tightly wound for a space of three-quarters of an inch along its lower part. Out of this binding emerge therefore, in the above-mentioned instance, the forty pairs of strands which are immediately tied to form the first course of forty knots and meshes. The second course has the same number, but thenceforth the number increases. Into every alternate mesh of this second course is looped another cord, thus producing in the third course

286 sixty meshes. This number is kept up to the seventh course, where twenty more cords, distributed at regular intervals, are looped in. Hence in the eighth course eighty knots appear. Thus the additions proceed at these regular intervals, twenty new elements being added at every fifth course up to the sixty-second course of knots. Since this process begins at the second course, these additions are made to come on those courses whose numbers end in two and seven—two, seven, twelve, seventeen, etc. Hence, when the sixty-third course is tied there is a total of three hundred knots and meshes, and this number is maintained throughout the remainder of the one hundred and twenty-seven courses of the net. The meshes of this particular net are two centimeters square throughout its length of eight feet, seven inches. As it is cast by a fisherman it easily covers a circle ten or twelve feet in diameter.

227
286 These nets are usually made of fine pita cord in the upper part of the cone and of slightly coarser cord in the last quarter or third near its mouth. The heavier cord is apparently used in this portion of the net because of the greater wear and tear due to the struggles of the entrapped fish and because the net is weighted about its mouth with sinkers. These lead or stone sinkers often aggregate twenty-five to thirty pounds in weight and carry the net quickly to the bottom.

286
[352] The only other netted device made by the Cayapa is the hammock, which is made either of coarse pita string or of the heavy kuna-kuna string. The meshes of such a hammock are very coarse, hence comparatively few cords are required. To start with, the proper number

**3: Barrett E-5 (1908-1909)1925**
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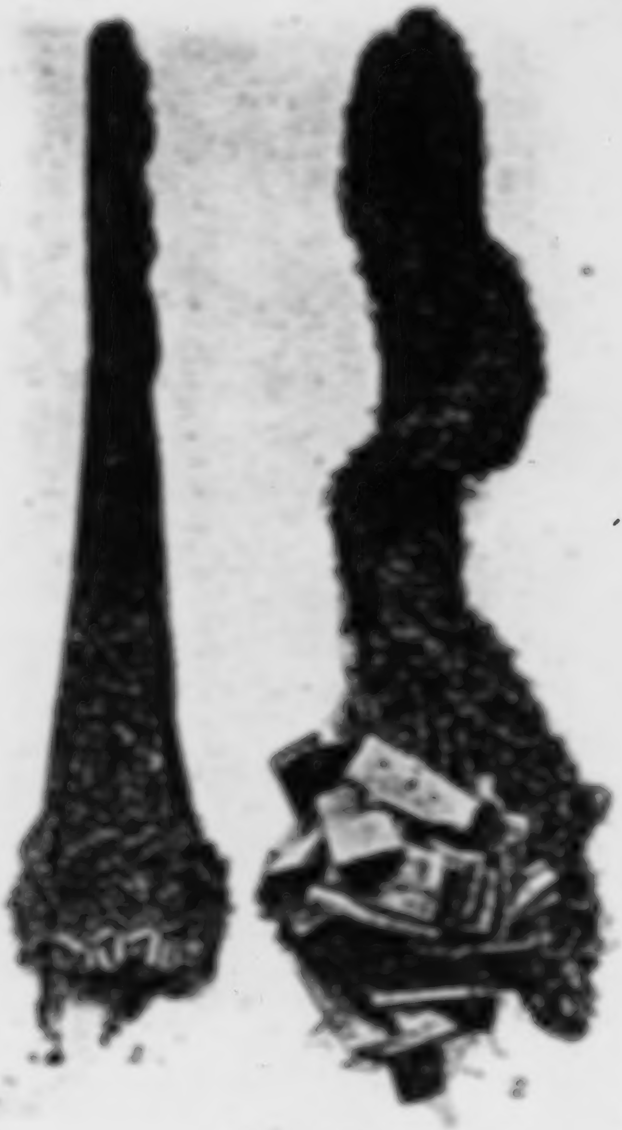

FISHING NETS

[p. 284(1)]

BARRETT—CAYAPA INDIANS PL. CXXI

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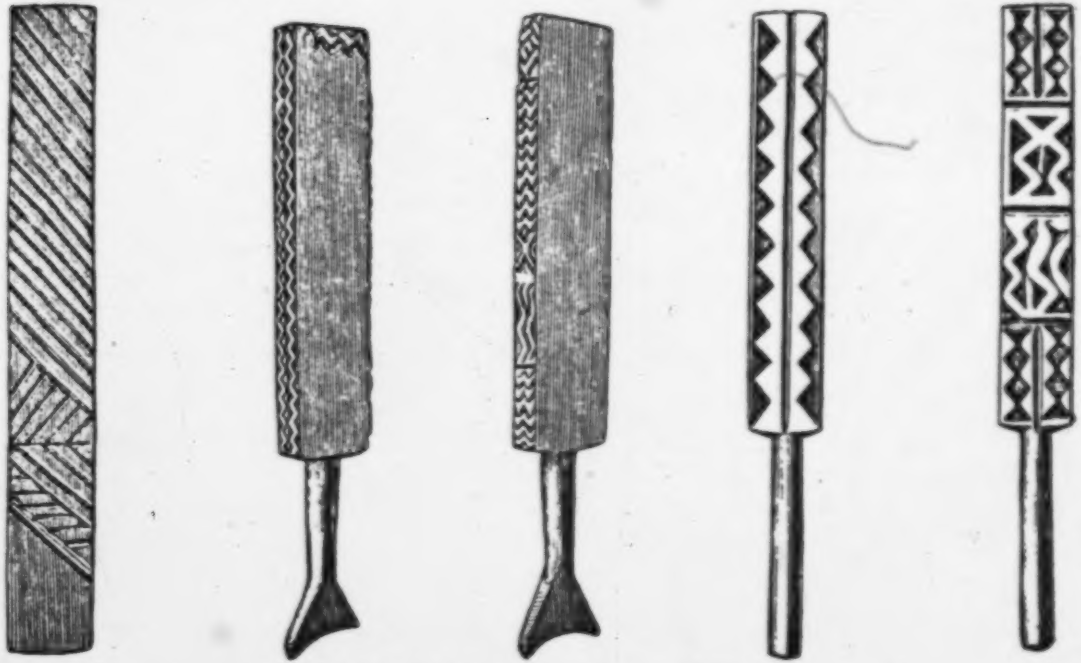

CARVED FACE-PAINTING STICKS

[p.284(B)]

3: Barrett E-5 (1908-1909) 1925
SD6 Cayapa SD6

of cords is selected and of them is made a large loop, the lower inch or so of which is securely wrapped as in the case of the loop of the casting net, and it is from this wrapping that the cords emerge. In one instance, that of a hammock made of pita cord, there are fourteen of these cords coming out of this wrapping. To these are added the end of the cord with which the wrapping is done. With these fifteen cords the body of the hammock is woven. Each alternate course of knots numbers seven, while the next course contains eight. The meshes of such hammocks are not made over a mesh-stick, and hence vary somewhat in the same hammock. In the example above mentioned they range from four and one-half to six inches square. In this instance seventeen courses of knots were required to complete the hammock, which, when closed and stretched, measures eight feet in extreme length. The second end is finished off with the same kind of a loop as that above described. The description of this hammock will serve for all, there being little variation. 286

## DECORATIVE ART

From considerations of technic the decorative art of the Cayapa falls into four classes: textile decoration, incised decoration, painting, and carving. In the first class belong such designs as appear on twilled baskets, fans, mats, and soft textiles; the second class is confined entirely to the surfaces of calabash utensils and to a slight extent to pottery; the third is found on canoes and on the human body; and the fourth class is confined to wooden dolls, paddle handles, and sometimes seats. 531

531 In the matter of the forms also, the designs fall practically into these general groups, though in certain instances the same design is found in more than one group. Taken as a whole Cayapa designs are largely geometric, the only exceptions being in the carved wooden dolls, in a few calabash designs, and in a considerable number
[177] of the designs on soft textiles. Now and then a realistic modern design is found also upon a canoe and in rare instances in a painting upon the human body. This entire statement applies to the frequency of occurrence of the different types of design. If considered, however, from the standpoint of the number of various elemental designs of the realistic class as compared with elemental designs of the strictly geometric class, the former are fully equal to the latter, though the geometric designs are subject to greater variation.

[552] It is remarkable that few names are given designs except in the case of those on soft textiles. In the case of the face, arm, and leg paintings, for instance, no names were obtainable, and they have no symbolic significance. This fact is noteworthy when so large a series of designs is found (pl. XXXIX–LII) and when they are so universally and extensively used. The only exception to this rule is that of the trident-shape design shown in pl. LII, 11. This, however, is strictly modern and was copied directly from the fish-spear.

501
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[552] Also in the considerable series of canoe designs shown in pl. LXXII–LXXV, no specific names were given by informants. These are all old-type designs and much preferred by the Cayapa to the modern designs which some paint on canoes made for sale, but never upon those

designed for their own use. In every instance these old- 501
type designs are geometric, but the newer ones are usual- 531
ly realistic, depicting mammals, human beings, and other
realistic objects.

In carving, the dolls are entirely realistic, as is shown 532
in pl. LXXXIV, and depicting, the dog, alligator, bird, 524
and especially the human form. In the last instance
care is usually taken to indicate the sex. In paddle 501
handles, on the other hand, the forms are usually simple 531
and are always geometric, as is shown in pl. LXXVI.
They have no special names. Even in the case of the [552]
elaborately carved handle shown in fig. 9 of the plate,
no name was given for any of the designs. The same 302
holds true of the designs in the face-painting sticks 531
depicted in pl. CXVI–CXXII.

Closely related to ornamental carving are the wooden 531
seats shown in pl. LXXXIII, some of which receive orna- 352
mental treatment certainly not demanded by utilitarian 171
considerations. From comparison with similar objects of South and Central America it seems probable that in these seats, especially the forms shown in figs. 2 and 3, there lies a striking connection of the Cayapa culture with that of a number of other tribes in these regions. As has been shown by Professor Saville,[15] the archeological range of these objects is extensive, the most elaborate among them being the large stone seats from Manabi, carved to represent jaguars.

On the surfaces of calabash utensils are found the only 531
incised designs in use among the Cayapa. These are 415

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[15] See page 156, note.

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415
made by cutting with the point of a knife or machete through the calabash rind, exposing the inner, white, hard portion which at first contrasts greatly with the brown general surface of the utensil. After such a utensil has been used for a time the incised designs also become brown. The calabash designs shown in pl. LXXXVI present various realistic figures, as well as a considerable number of geometric designs. In the small series of figures shown in this plate there are ten recognizable animal forms, namely:

| *Subject* | *Figures* |
|---|---|
| Human being | 1–4 |
| Human being on horse | 5, 9 |
| Monkey | 6 |
| Horse or dog | 18 |
| Bird | 10–12 |
| Lizard | 13 |
| Turtle | 16 |
| Crab | 14, 36 |
| Scorpion | 7 |
| Tick | 15 |
| Animal (unknown form) | 8, 17 |

The majority of these designs are relatively small, but in the crab design shown in fig. 36 of pl. LXXXVI, is presented a notable exception. This design appeared about the opening of a large, spherical, water-storage calabash and covered about half the entire surface of the vessel. The usual names given to the various animals themselves are also applied to these designs. As usual, on the other hand, the geometric figures are frequently unnamed.

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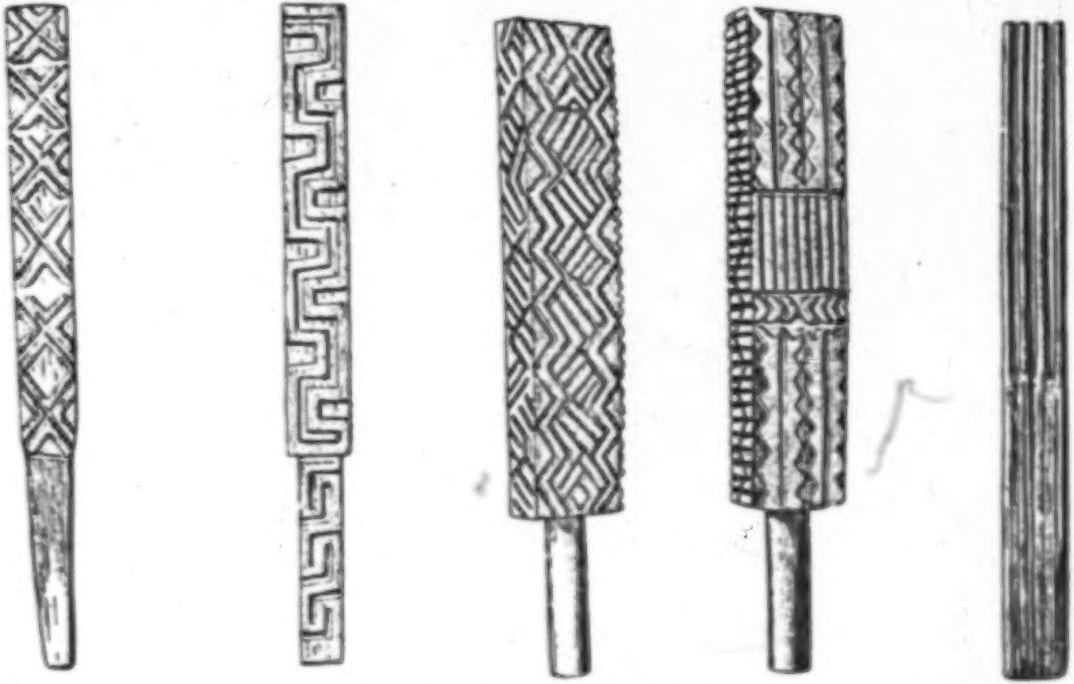
Cayapa pottery is very simple in its forms and is entirely without decoration except in rare instances in

BARRETT--CAYAPA INDIANS PL. CXXII



CARVED FACE-PAINTING STICKS

[p.288(A)]

3: Barrett E-5 (1908-1909) 1925
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3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

BARRETT—CAYAPA INDIANS

PL. CXXIII

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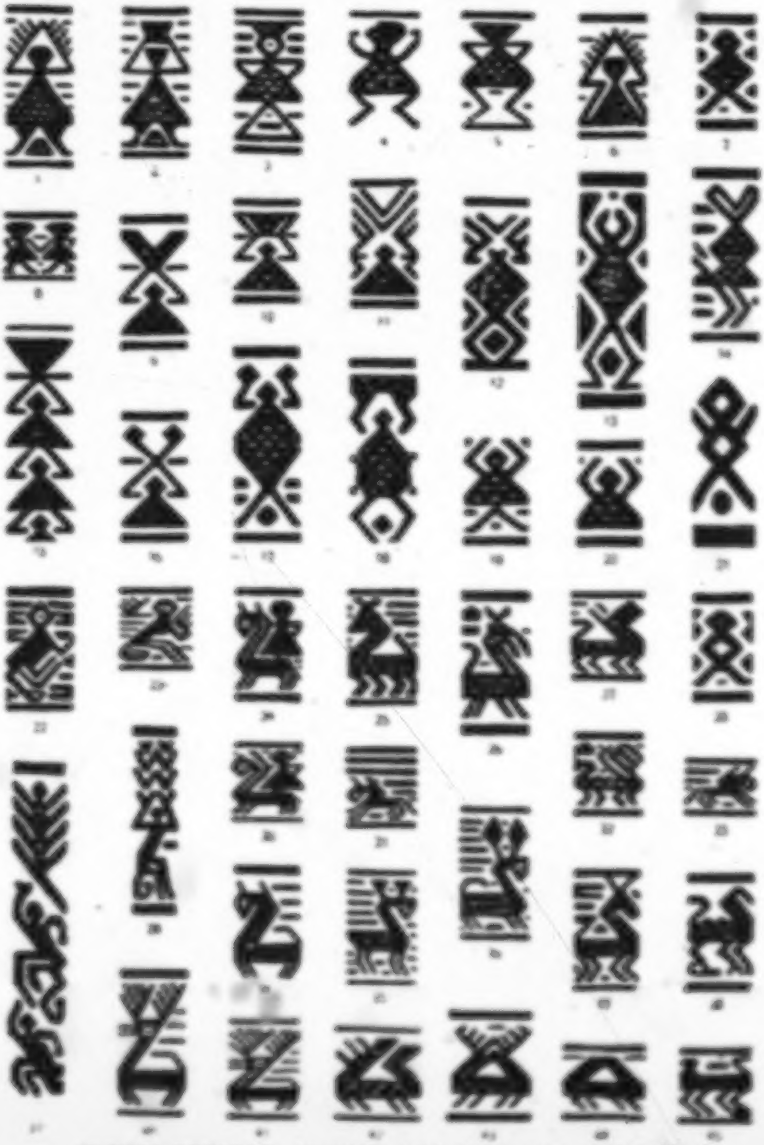


CLOTH DESIGNS: HUMAN AND MAMMAL FIGURES

[p.288(a)]

which a slight attempt is made to ornament the edge 531
of the shoulder of a vessel, with a few incised lines or 323
dots. No names are given to these simple decorations,
and no attempt is made to work out any regular patterns
even in the rare instances in which they are used.

The designs in hard textiles—twilled baskets, mats, and 531
fans—are purely geometric, fairly simple (as is shown in 285
pl. cv), and few in number. These conditions are quite
natural and are imposed by the character of the material
and the technic employed. There is comparatively little
naming of these designs. Zigzags such as those shown
in figs. 3 and 5 of the plate are called dĕ'tcû, and figures
such as are illustrated in figs. 25 and 27 are commonly
called kapû'ka, signifying "eye."

## Soft Textile Designs

It is in the soft textiles that the greatest variety of 531
both geometric and realistic designs appears and where 552
the only detailed naming of designs occurs. A table of 286
the names of the various manta designs shown in pl.
cxxiii-cxxvii, together with a glossary, is given in the
following pages. From these data various interesting
facts concerning the names of manta designs are apparent.

The names may be classified as: mammals, birds, reptiles, insects, miscellaneous animate objects, parts of animate objects, plants, artificial objects, geometric figures, and untranslatable terms. The following tabulation will show the various numbers in each class.

286 *Mammals:*
531 human being
552 monkey (two species)
horse
burro
cow
dog
goat
sheep
guinea pig
deer

*Birds:*
pī'tcū
la'pitcū
tū'mbitcīlīlī
hawk
pelican
turkey
buzzard
frigate bird
duck
egret
dove (general term)
  pactū'kū
  wa'pū'pū
chicken

*Reptiles:*
snake (general term)
boa constrictor
lizard

*Insects:*
centipede
scorpion
tick
spider

*Miscellaneous animate objects:*
crab
  nē'lū
  te'pūi nē'lū
  There are also three compound terms in which the word crab appears.

turtle
toad

*Parts of animate objects:*
eye (general term)
  little eye
  kapū'ka ya dētcū
  ka'pū tcīlara
  kapūka dalala ke''tū
  dū'lalara kapūka
ear
lizard foot
lizard egg
tongue of sting-ray

*Plants:*
pitigua
fruit

*Artificial objects:*
feast table
belt or girdle
ladder
steps of ladder
stick used for face painting
top
bait
steel, of "flint-and-steel"
canoe design
cross
handkerchief design
  also te'mbū balya'lya

*Geometric figures:*
zigzag
  se'rañ dētcū
  ē' dētcū
  ūyū'mī dētcū
  de''pañmī dētcū
  dē'tcū serañ tsū'a
horizontal

*Miscellaneous:*
technic (the bandilas technic is mentioned).
color

286
531
552

*Untranslatable terms:*

- balya'lya
- balya'lyac
- delam ba''ta
- de'we
- dū'lalara
- hō'lara
- hū''la
- hū'lara
- hū'rula
- hū'rūlara
- kūē'bū
- nim bī'lya
- pala'cla
- pala'la
- pala'c lara
- pala'lac
- pala'lara
- pala'ra
- palû'c lara
- pala'tcū
- petī
- pū'ka ka
- se'rañ
- tapū'lyū
- tē'pū balya'lya
- tyūlya'lya
- tyūm bī'lya
- wīlû'cla
- tyū'ndyū tcī lara

286
531

While there is a large series of geometric figures, as shown in pls. CXXV–CXXVII, and while these appear on mantas in fully as great as, if not in greater numbers than do the realistic figures, inspection shows that these are really variations of a comparatively few geometric elements, chiefly the zigzag, the cross, the triangle, and the rectangle, and that in reality there are not such a large number of distinctive designs as might at first appear. Furthermore, an inspection of the native names of these designs, most of which are of the untranslatable class, shows that the Cayapa recognize these similarities and that little realism is read into the designs by them. In fact the designs called eye, steps of a ladder, crab design (by which is meant the tracks made by a crab in the mud), and steel for striking fire, are the only ones of known significance that show evidence of a tendency toward realism in geometric forms. There may be among the untranslatable terms some which would, if their significations were known, show a similar tendency.

286
531
552

286 531 Conventionalization of realistic designs, on the other hand, is somewhat more common, though this conventionalization is such as might be expected to be imposed by the nature of the textile and by the technic employed. Among the best examples of this are such human beings as those shown in pl. CXXIII, 12–16, or such toads as those illustrated in 17 and 18 of the same plate.

Another good example of this tendency is shown in fig. 42, called pelican, and in fig. 45 which is called dog and also monkey. In general this tendency toward the conventionalization of realistic designs appears to be present chiefly among the more unskilled weavers, and it will be observed that as a rule the more finely woven and better textiles from a technical point of view show correspondingly greater skill in design and a greater tendency toward realism. In such textiles the designs are usually of such a nature that there can be no doubt as to their import.

Perhaps one of the most striking features of the textile patterns of the Cayapa is what may be termed an abhorrence of vacant spaces. It will be observed that in a design to which any claim to elaborateness can be made, the tendency is to fill all corners and small areas, not *directly* connected with the main motif of the pattern, with lines, dots, or other small figures.

531 In conclusion, therefore, it may be said that the decorative art of the Cayapa is characterized by the following features:

1. A predominance of geometric patterns which in a large measure bear no names and have no definite signification.

2. The presence upon textiles, and to a lesser extent upon calabash utensils, of realistic designs, which in certain instances tend toward conventionalization. 531

3. A slight tendency toward the assignment of realistic significations to what appear to be purely geometric forms.

4. The abhorrence of vacant spaces, shown by the filling of all small areas about a large design with dots, lines, and other irrelevant devices.

### TABLE OF MANTA DESIGN NAMES

286
531
552

| PLATE | FIGURE | |
|---|---|---|
| CXXIII | 1 | human being (tca'tcï) |
| | 2 | human being (tca'tcï) |
| | 3 | human being (tca'tcï) |
| | 4 | human being (tca'tcï) |
| | | toad (sa'pü, Spanish sapo) |
| | 5 | human being (tca'tcï) |
| | 6 | human being (tca'tcï) |
| | 7 | human being (tca'tcï) |
| | 8 | human being (tca'tcï) |
| | 9 | pala'la (untranslatable) |
| | 10 | pala'la (untranslatable) |
| | 11 | balya'lyac (untranslatable) |
| | 12 | spider (mü'tele, Spanish araña) |
| | | human being (tca'tcï) |
| | 13 | human being (tca'tcï) |
| | 14 | human being (tca'tcï) |
| | 15 | human being (tca'tcï) |
| | 16 | human being (tca'tcï) |
| | 17 | toad (sa'pü, Spanish sapo) |
| | | hü'rülara or hü''la (untranslatable) |
| | 18 | toad (sa'pü, Spanish sapo) |
| | 19 | human being (tca'tcï) |
| | | toad (sa'pü, Spanish sapo) |
| | 20 | toad (sa'pü, Spanish sapo) |
| | 21 | hü''la or pala'tcu (untranslatable) |

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

286
531
552

| Plate | Figure | |
|---|---|---|
| CXXIII | 22 | monkey (cü'ri, Spanish machin, mico; and wo'cü, Spanish mono) |
| | 23 | monkey (cü'ri, Spanish machin, mico) |
| | 24 | horse (k wa'lyü, Spanish caballo), with human being (tca'tci) |
| | 25 | horse (kawa'lyü, Spanish caballo) |
| | 26 | horse (kawa'lyü, Spanish caballo)<br>goat (tci'bü, Spanish chivo) |
| | 27 | horse (kawa'lyü, Spanish caballo)<br>goat (tci'bü, Spanish chivo) |
| | 28 | ho'lara (untranslatable)<br>human being (tca'tci) |
| | 29 | monkey (cü'ri, Spanish machin, mico) |
| | 30 | horse (kawa'lyü, Spanish caballo), with human being (tca'tci) |
| | 31 | monkey (cu'ri, Spanish machin, mico)<br>horse (kawa'lyü, Spanish caballo) |
| | 32 | No interpretation obtained |
| | 33 | horse (kawa'lyü, Spanish caballo) |
| | 34 | horse (kawa'lyü, Spanish caballo) |
| | 35 | cow (wagu'ra, Spanish vaca) |
| | 36 | horse (kawa'lyü, Spanish caballo) |
| | 37 | horse (kawa'lyü, Spanish caballo) |
| | 38 | pelican (nana'' ka, Spanish alcatraz)<br>crab (ne'lü, the small red land-crab)<br>monkey (wa'cü, Spanish mono) |
| | 39 | monkey (cü'ri, Spanish machin, mico) |
| | 40 | deer (ma'na) |
| | 41 | deer (ma'na)<br>hawk (hāya'lyü, Spanish gabilan) |
| | 42 | pelican (nana'' ka, Spanish alcatraz) |
| | 43 | human being (tca'tci) |
| | 44 | No interpretation obtained |
| | 45 | dog (kü'tca)<br>monkey (wo'cü, wa'cü, Spanish mono) |
| CXXIV | 1 | guinea pig (a''tse)<br>sheep (ilic'a, Spanish oveja) |
| | 2 | guinea pig (a''tse) |
| | 3 | guinea pig (a''tse) |
| | 4 | sheep (ilica, Spanish oveja)<br>guinea pig (a''tse) |

**3: Barrett E-5 (1908-1909)1925**

**SD 6 Cayapa SD6**

| PLATE | FIGURE | | |
|---|---|---|---|
| CXXIV | 5 | human being (tca'tci), with guinea pig (a''tse), or sheep (ŏi'ca, Spanish oveja) | 286 |
| | 6 | human being (tca'tci), with sheep (ŏi'ca, Spanish oveja), or guinea pig (a''tse) | 531<br>552 |
| | 7 | horse (kawa'lyŭ, Spanish caballo) | |
| | | dog (kŭ'-ca) | |
| | 8 | guinea pig (a''tse) | |
| | | sheep (ŏi'ca, Spanish oveja) | |
| | 9 | goat (tci'bŭ, Spanish chivo) | |
| | 10 | guinea pig (a''tse) | |
| | | cow (waga'ra, Spanish vaca) | |
| | 11 | guinea pig (a''tse) | |
| | | burro (bŭ'rŭ) | |
| | 12 | An animal form for which no name was obtained | |
| | 13 | An animal design; no information available. It resembles a lizard and might be given by the Cayapa the name of any one of several species of lizards. | |
| | 14 | horse (kawa'lyŭ, Spanish caballo) | |
| | 15 | cow (waga'ra, Spanish vaca) | |
| | 16 | monkey (cŭ'rŭ, Spanish machin, mico) | |
| | | sheep (ŏi'ca, Spanish oveja) | |
| | 17 | human being (tca'tci) | |
| | | tyu'ndyŭ tci lara (untranslatable) | |
| | 18 | An animal form; no name obtained | |
| | 19 | dog (kŭ'tca) | |
| | 20 | bird (pi'tcŭ, particular species not stated | |
| | 21 | pelican (nama'ka) | |
| | | horse (kawa'lyŭ). These names apply to the large bird which is the chief figure in this design. | |
| | | *The small triangular portion* of this design is called tembŭ lalya'lya or tembŭ pi'lya (tembŭ, a contraction of tembŭ'pŭ, signifying handkerchief) | |
| | 22 | domestic turkey (kasti'lya walya'pa, literally Spanish or Castilian chicken) | |
| | | kŭt'bŭ (untranslatable) | |
| | 23 | bird (pi'tcŭ) | |
| | 24 | bird (pi'tcŭ) | |
| | | dove (a small species of a reddish color, called by the Cayapa ou'pŭ'pŭ) | |

3: Barrett E-5 (1908-1909)1925

SD6 Cayapa SD6

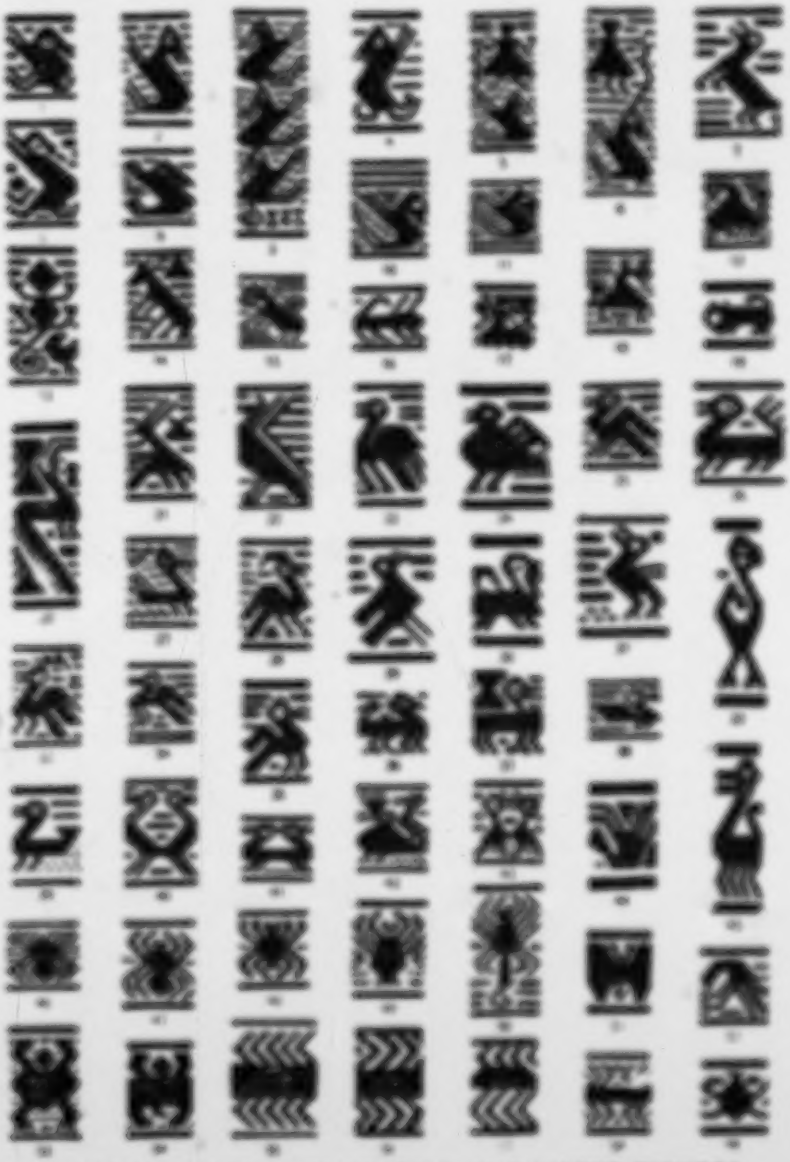
286
531
552

| PLATE | FIGURE | |
|---|---|---|
| CXXIV | 25 | pelican (nana''ka) |
| | | dove (a large reddish species, called in Cayapa pactü'kü) |
| | 26 | pelican (nana''ka) |
| | | chicken (walya'pa) |
| | 27 | No name was obtained. It resembles the design shown in figure 33, which was called pelican (nana''ka) |
| | 28 | horse (kawa'lyü, Spanish caballo). This interpretation appears to be in error. The design is clearly a bird form, not that of a horse. It resembles in all essential details the design shown in figure 33, which was called pelican (nana''ka) |
| | 29 | white egret (ka''tsü, Spanish garsa) |
| | | bird (pi'tcü) |
| | | pelican (nana''ka) |
| | | dove; exact species not stated |
| | 30 | pelican (nana''ka) |
| | 31 | bird (pi'tcü) |
| | | dove; exact species not stated |
| | 32 | No name was obtained for this design, but in many respects it resembles that shown in figure 45, which was called white egret (ka''tsü, Spanish garsa) |
| | 33 | pelican (nana''ka) |
| | 34 | frigate bird (nyambüwa'tü) |
| | 35 | pelican (nana''ka) |
| | 36 | buzzard (kü'ndürürü, petyü'tyü, Spanish gallinaza) |
| | | pelican (nana''ka) |
| | | horse (kawa'lyü, Spanish caballo) |
| | | goat (tci'bü, Spanish chivo) |
| | 37 | pelican (nana''ka) |
| | | chicken (walya'pa) |
| | 38 | pelican (nana''ka) |
| | | duck (pa'tü, Spanish pato) |
| | 39 | tu'mbücüllü (a small black bird with red beak) |
| | 40 | pelican (nana''ka) |

# 3: Barrett E-5 (1908-1909)1925
## SD 6 Cayapa SD6

BARRETT—CAYAPA INDIANS PL. CXXIV

286
531
552



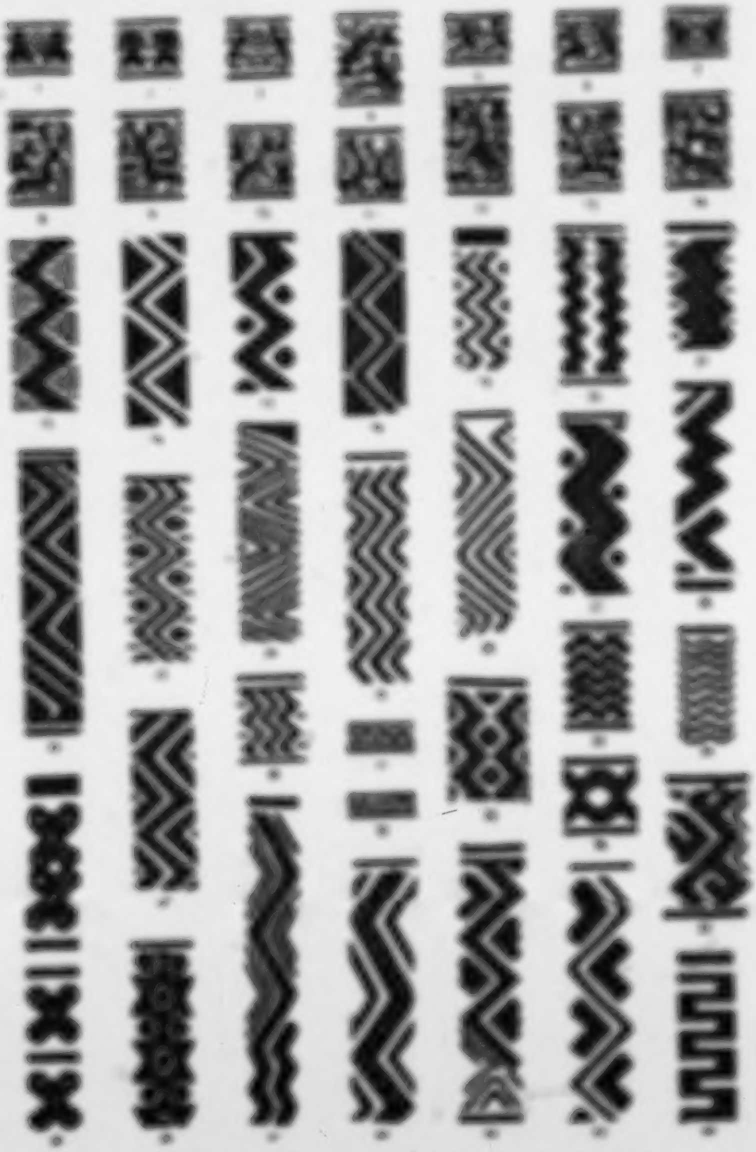
CLOTH DESIGNS: MAMMAL, BIRD, AND INSECT FIGURES

[p. 296 (a)]

3: Barrett E-5 (1908-1909)1925

SD6 Cayapa SD6

286
531
532



CLOTH DESIGNS: MAMMAL GROUPS AND GEOMETRIC FIGURES

[p. 216 a]

3: Barrett E-5 (1908-1909)1925

SD 6 Cayapa SD6

256
531
552

| Plate | Figure | |
|---|---|---|
| CXXIV | 41 | pelican (nana''ka) |
| | 42 | dove (a small reddish species, called by the Cayapa wa'pü'pü) |
| | 43 | No name was obtained for these two birds. They would be called birds (pi'tcü), at least, and would probably be given specific names |
| | 44 | bird, a small species, black and yellow in color, a good singer and is much kept by the Cayapa as a pet (la'pi'tcü, Spanish pichicho) |
| | | buzzard (petyü'tyü, ki'ndütetcü, Spanish gallinaso) |
| | 45 | white egret (ka''tcü, Spanish garsa) |
| | 46 | spider (mü'tcle, Spanish araña) |
| | 47 | spider (mü'tcle, Spanish araña) |
| | 48 | spider (mü'tcle, Spanish araña) |
| | 49 | scorpion (alaga'ra, Spanish alacrán) |
| | | spider (mü'tcle, Spanish araña) |
| | 50 | scorpion (alaga'ra, Spanish alacrán) |
| | 51 | No name obtained for this butterfly-like design |
| | 52 | No name obtained for this bird-like design |
| | 53 | turtle (pitci'li) |
| | 54 | turtle (pitci'li) |
| | 55 | crab—the small red land-crab (se'lü) |
| | | crab—a certain coast species (fepüi se'lü) |
| | | karna'da (probably from the Spanish). The term is said to signify bait and also to be the name of a certain species of crustacean called in Spanish camaron brava |
| | 56 | crab—the small red land-crab (se'lü) |
| | 57 | centipede (se'pisdo) |
| | 58 | bändei'ka (pianda, a species of lizard) |
| | | crab—the small red land-crab (se'lü) |
| | 59 | turtle (pi'tci'li) |
| | | toad (sa'pü, Spanish sapo) |
| CXXV | 1 | human being (tca'tci) |
| | 2 | human being (tca'tci) |
| | 3 | monkey (cü'ri, Spanish machin, mico) |
| | 4 | monkey (cü'ri, Spanish machin, mico) |

# 3: Barrett E-5 (1908-1909)1925
## SD6 Cayapa SD6

286
531
552

| Plate | Figure | |
|---|---|---|
| CXXV | 5 | monkey (cü'ri, Spanish machin, mico) |
| | 6 | bird (pi'tcü) with monkey (cü'ri) |
| | 7 | No interpretation was obtained for these figures. They resemble some others which were called horses and are probably intended to represent that animal |
| | 8 | horse (kawa'lyü, Spanish caballo), with deer (ma'na) |
| | 9 | deer (ma'na) |
| | 10 | man (tca'tci), with deer (ma'na), and bird (pi'tcü) |
| | 11 | deer (ma'na) |
| | 12 | deer (ma'na) with dogs (kü'tca) |
| | 13 | deer (ma'na) with bird (pi'tcü) |
| | 14 | horses (kawa'lyü, Spanish caballo), with bird (pi'tcü) |
| | 15 | zigzag (dë'tcü). The exact names of zigzags are governed by their relative size and their relations to those with which they are associated; viz.:<br>de'"pahmi dë'tcü = horizontal zigzag<br>tyümi dë'tcü = vertical zigzag<br>e' dë'tcü = big zigzag<br>se'raü dë'tcü, untranslatable form of zigzag<br>lya'tena (the palm-wood steps of the house ladder). This name refers to the short lines which fill the spaces at the angles formed by the zigzag |
| | 16 | *zigzag (dë'tcü). See fig. 15 above.* |
| | 17 | zigzag (dë'tcü). See fig. 15 above.<br>eye (kapü'ka). This term applies to the diamond-shape figures in the angles formed by the zigzag. |
| | 18 | big zigzag (e' dëtcü) |
| | 19 | zigzag (dë'tcü). See fig. 15 above |
| | 20 | zigzag (dë'tcü). See fig. 15 above<br>pitigua design (tyüm bi'lya)<br>feast table (pa'kigi) |
| | 21 | pitigua design (etcüm biü, from te'tcüm bilya)<br>snake (pini) |

3: Barrett E-5 (1908-1909) 1925

SD 6 Cayapa SD6

286

531

552

| PLATE | FIGURE | |
|---|---|---|
| CXXV | 22 | serañ dĕ'tcū (an untranslatable form of zigzag) |
| | 23 | zigzag (dĕ'tcū). See fig. 15 above<br>eye (kapū'ka) and little eye (ka' kapūka) refer to the diamond-shape figures in the angles formed by the zigzag |
| | 24, 25, 26 | zigzag (dĕ'tcū). See fig. 15 above. |
| | 27 | big zigzag (e' dētcū)<br>eye (kapū'ka and small eye (ka kapū'ka) refer to the diamond-shape figures in the angles of the zigzag |
| | 28 29, 30 | zigzag (dĕ'tcū). See fig. 15 above |
| | 31 | zigzag (dĕ'tcū). See fig. 15 above<br>pīlya dĕ'we (pī'lya signifies design, and it appears that dĕ'we may possibly be related to dĕ'tcū, meaning zigzag. This design consists in part of a zigzag) |
| | 32 | big zigzag (e' dētcū)<br>hū'rūlara, hū''la (untranslatable)<br>eye (kapū'ka). This term applies to the diamond-shape portions of the design |
| | 33 | zigzag (dĕ'tcū). See fig. 15 above |
| | 34 | zigzag (dĕ'tcū). See fig. 15 above<br>tongue of sting-ray (tyū'wī nī'ka) |
| | 35 | zigzag (dĕ'tcū). See fig. 15 above<br>hū'rūlara, hu''la (untranslatable) |
| | 36 | bīmbū'ka (piande, a small species of lizard)<br>e pala'tcū (e signifies big; pala'tcū is untranslatable) |
| | 37 | zigzag (dĕ'tcū). See fig. 15 above |
| | 38 | pala'ra (untranslatable)<br>pala'tcū (untranslatable)<br>hū'rūlara, hū''la (untranslatable) |
| | 39 | No interpretation was given for this design, since it appears to be of modern origin. Such a modern design is usually called te'mbū pīlya, which signifies handkerchief design from the fact that they are derived largely from handkerchiefs of modern manufacture |
| | 40 | big zigzag (e' dētcū) |
| | 41, 42, 43 | zigzag (dĕ'tcū). See fig. 15 above |

[177]

286
531
552

| Plate | Figure | |
|---|---|---|
| CXXV | 44 | palm-wood steps of the house ladder (lya'tena) |
| | | belt (tcû'mbî). This term should be tcû'mbî pîlya, which signifies belt design and is applicable to any design which appears on a belt |
| CXXVI | 1 | balya'lyac (untranslatable) |
| | | eggs of a species of lizard called bîmbû'ka (bî'mbû napîpû) |
| | 2 | hû'rûlara, hû''la (untranslatable) |
| | 3 | eggs of a species of lizard called bîmbû'ka (bî'mbû napîpû) |
| | | pû'ka ka (this appears to be really ka' pûka which means small fruit) |
| | | big zigzag (e' dêtcû) |
| | | balya'lyac (untranslatable) |
| | | hû'rûlara, hû''la (untranslatable) |
| | 4 | hû'rûlara, hû''la (untranslatable) |
| | | balya'lyac (untranslatable) |
| | | pû'ka ka (apparently signifies small fruit) |
| | 5 | foot of a small species of lizard (bî'mbû nyapa) |
| | | e hû''la (e signifies large; hû''la is untranslatable) |
| | 6 | egg of a small species of lizard (bî'mbû napîpû) |
| | | hû'rûlara, hû''la (untranslatable) |
| | 7 | balya'lyac (untranslatable) |
| | | tyû'ndyu tcî lara (untranslatable) |
| | 8 | balya'lyac (untranslatable) |
| | | tyû'ndyû tcî lara (untranslatable) |
| | | handkerchief design (tê'mbû pîlya) |
| | 9 | balya'lyac (untranslatable) |
| | | tyû'ndyû tcî lara (untranslatable) |
| | | hû''lara (untranslatable) |
| | | handkerchief design (te'mbû pîlya) |
| | 10 | balya'lyac (untranslatable) |
| | | belt design (tcû'mbî pîlya). (This term is applied to any design on a belt, regardless of the nature of the design) |
| | | big zigzag (e' dêtcû) |

J

286
531
552

| PLATE | FIGURE | |
|---|---|---|
| CXXVI | | palm-wood steps of a house ladder (lya'tena). (This term applies to the horizontal lines which form part of this design) |
| | | tyû'ndyû tcî lara (untranslatable) |
| | 11 | balya'lyac (untranslatable) |
| | | te'pû balyalya (untranslatable) |
| | | pala'c lara (untranslatable) |
| | 12 | balya'lyac (untranslatable) |
| | | tyû'ndyû tcî lara (untranslatable) |
| | 13 | balya'lyac (untranslatable) |
| | | horizontal design (de'' pañ bîlya) |
| | | tyû'ndyû tcî lara (untranslatable) |
| | 14 | balya'lyac (untranslatable) |
| | | handkerchief design (te'mbû pîlya) |
| | 15 | balya'lyac (untranslatable) |
| | 16 | balya'lyac (untranslatable) |
| | | belt (tcû'mbî). (This term should be tcû'mbî pîlya, signifying belt design. It is equally applicable to any design which appears on a belt) |
| | 17 | balya'lyac (untranslatable) |
| | | belt (tcû'mbî). (This term should be tcû'mbî pîlya, signifying belt design. It is equally applicable to any design which appears on a belt) |
| | 18 | No interpretation obtained |
| | 19 | No interpretation obtained |
| | 20 | No interpretation obtained |
| | 21 | zigzag (dê'tcû). See pl. cxxv, fig. 15, above |
| | | belt (tcû'mbî). (This term is applicable with equal propriety to all designs appearing on belts; its full form is tcû'mbî pîlya) |
| | 22 | eggs of a species of small lizard called bimbû'ka (bî'mbû napipû) |
| | | tyûlya'lya (untranslatable) |
| | | hû'rûlara, hû''la (untranslatable) |
| | | pû'te wilûcla (pû'te signifies hamper-shape basket; wilû'cla is untranslatable) |
| | 23 | balya'lyac (untranslatable) |
| | | ladder (lya'pi) |

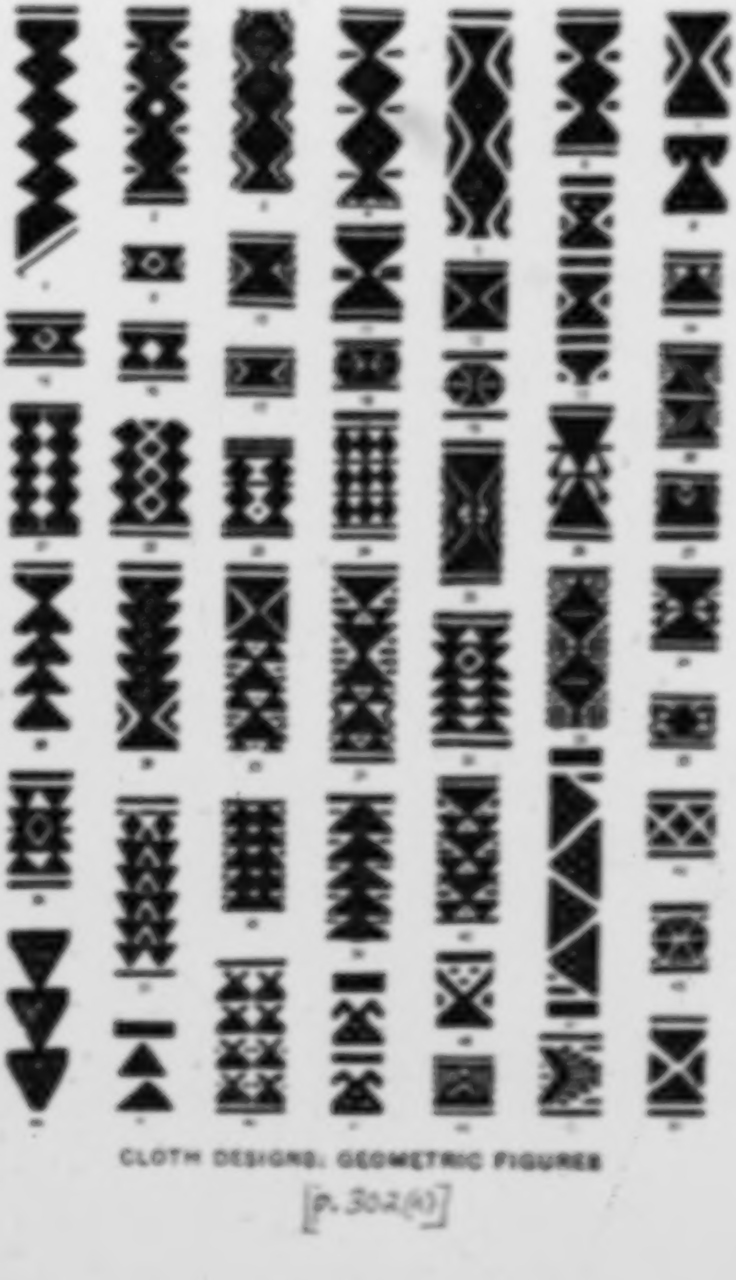
**3: Barrett E-5 (1908-1909) 1925**

**SD 6 Cayapa SD6**

286
531
552

| PLATE | FIGURE | |
|---|---|---|
| CXXVI | 24 | No name obtained |
| | 25 | No name obtained |
| | 26 | No name obtained |
| | 27 | No name obtained |
| | 28 | belt (tcû'mbi). (This term applies to any design which appears on a belt; its full form is tcû'mbi pîlya) |
| | | tyûlya'lya (untranslatable) |
| | 29 | mö'pitcipapa, möpi ke'nû tcipapa. (The carved stick used as an implement with which to apply the red and yellow face paint) |
| | | tyûlya'lya (untranslatable) |
| | | balya'lyac (untranslatable) |
| | | tyûm bi'lya (bi'lya signifies design, tyûm appears to come from te'tcûa, signifying pitigua). (The connection of the design and name here is not very clear) |
| | 30 | handkerchief design (te'mbû pîlya) |
| | | tyûlya'lya (untranslatable) |
| | | pala'lara (untranslatable) |
| | 31 | handkerchief design (te'mbû pîlya) |
| | | tyûlya'lya (untranslatable) |
| | 32 | balya'lyac (untranslatable) |
| | | tyûm bi'lya (bi'lya signifies design, and tyûm appears to be derived from te'tcûa, signifying pitigua) |
| | 33 | No signification was obtained for this elaborate design |
| | 34 | balya'lyac (untranslatable) |
| | 35 | No signification obtained |
| | 36 | No signification obtained |
| | 37 | No signification obtained |
| | 38 | handkerchief design (te'mbû pîlya) |
| | | tyûlya'lya (untranslatable) |
| | 39 | No signification obtained |
| | 40 | handkerchief design (te'mbû pîlya) |
| | | tyûlya'lya (untranslatable) |
| | 41 | *zigzag* (dĕ'tcû). See pl. cxxv, fig. 15, above |
| | | te'pû balya'lya (untranslatable) |
| | | balya'lyac (untranslatable) |
| | | fruit (pû'ka) |

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6



281
531
552

CLOTH DESIGNS: GEOMETRIC FIGURES

[p. 302(a)]

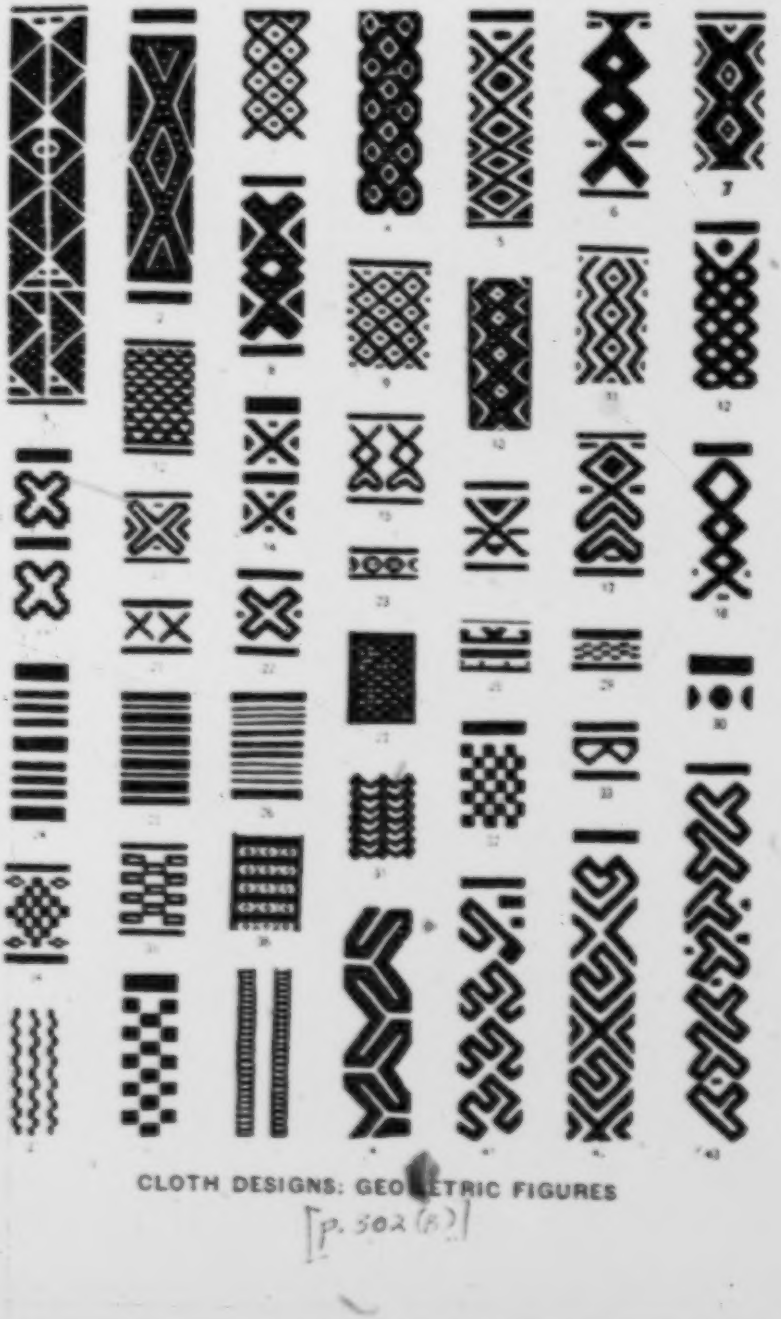
3: Barrett E-5 (1908-1909) 1925

SD 6 Cayapa SD6

BARRETT—CAYAPA INDIANS

PL. CXXVII

246
531
552



CLOTH DESIGNS: GEOMETRIC FIGURES

[p. 502 (B?)]

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

| Plate | Figure | | |
|---|---|---|---|
| CXXVI | 42 | pala'cla (untranslatable) | 286 |
| | | belt (tcû'mbi). (This term in full is tcû'mbi pilya, signifying belt design, and is applicable to all designs appearing on belts) | 531<br>552 |
| | 43 | balya'lyac (untranslatable) | |
| | | hō'lara (untranslatable term) | |
| | 44 | handkerchief design (te'mbû pilya) | |
| | | tyûlya'lya (untranslatable) | |
| | 45 | tyûlya'lya (untranslatable) | |
| | | tyû'ndyû tcī lara (untranslatable) | |
| | 46 | canoe design (kûm bī'lya) | |
| | | handkerchief design (te'mbû pilya) | |
| | 47 | handkerchief design (te'mbû pilya) | |
| | | te'mbû balyalya (te'mbû signifies handkerchief; balya'lya is untranslatable) | |
| | 48 | pala'tcû or palû'c lara (untranslatable) | |
| | 49 | pala'tcû (untranslatable) | |
| | | ears (pû'fige) | |
| | | centipede (se'pinde) | |
| | 50 | No signification obtained | |
| | 51 | No signification obtained | |
| CXXVII | 1 | big zigzag (e' dētcû) | |
| | | e pala'tcû (e signifies big; pala'tcû is untranslatable) | |
| | | boa constrictor (we'sû) | |
| | 2 | e hû'rûlara (e signifies big; hû'rûlara is untranslatable) | |
| | | pitigua design (tyûm bī'lya) (tyûm comes from te'tcûa, meaning pitigua) | |
| | 3 | ba'ndilas (a certain basketry technic). (This particular basketry technic is a kind of openwork which produces small squares similar to those shown here. It is clearly a case of the adaptation of this technic to this textile) | [285] |
| | | hû'rûlara, hû''la (untranslatable) | |
| | 4 | ba'ndilas (a certain basketry technic). See fig. 3 above | |
| | | zigzag (dē'tcû). (This interpretation seems doubtful) | |
| | 5 | hû'rûlara, hû''la. hû'rûla (untranslatable) | |

286
531
552

| PLATE | FIGURE | |
|---|---|---|
| CXXVII | 5 | eye (kapū'ka) |
| | | kapūka ya dē'tcu (eye ya zigzag) |
| | 6 | hū'rūlara, hu''la (untranslatable) |
| | 7 | e hū''la, hū''la (untranslatable) |
| | 8 | hū'rūlara, hū''la, pala'lac (untranslatable) |
| | 9 | ba'ndilas (a certain basketry technic). See fig. 3 above |
| | 10 | hū'rūlara, hū''la, e hū''la, ho' lara (untranslatable) |
| | 11 | zigzag (dē'tcū) |
| | | hū'rūlara, hū''la (untranslatable) |
| | 12 | ba'ndilas (a certain basketry technic). See fig. 3 above |
| | | crab design (ne' pīlya) |
| | | nim bī'lya (untranslatable) |
| | | zigzag (dē'tcū). (The connection seems doubtful) |
| | 13 | ba'ndilas (a certain basketry technic). See fig. 3 above |
| | 14 | pala'la, pala'lara, pala'tcū (untranslatable) |
| | 15 | hū'rūlara, hū''la (untranslatable) |
| | | turtle (pītcī'li) |
| | 16 | No interpretation obtained |
| | 17 | hū'rūlara, hū''la (untranslatable) |
| | 18 | No interpretation obtained |
| | 19 | pala'tcū, tapū'lyū (untranslatable) |
| | 20 | cross (karū'sa, from the Spanish cruz) |
| | | pala'tcu (untranslatable) |
| | | top (tōmbe'ta, from the Spanish trompo) |
| | 21 | pala'cla (untranslatable) |
| | | belt (tcū'mbī). (This term in full is tcū'mbī pīlya, belt design, and is equally applicable to all designs occurring on belts) |
| | 22 | big zigzag (ē' dētcu) |
| | | ī'clabō ñ (iron used with flint in striking fire) |
| | 23 | eye (kapū'ka) |
| | 24 | lyā'tena (the palm-wood steps of a ladder) |
| | | ne' pīlya tyūndyū tcī lara (ne' pīlya signifies crab design; the remainder of the term is untranslatable) |

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

| Plate | Figure | | |
|---|---|---|---|
| CXXVII | 24 | tyū'ndyū tci lara (untranslatable) | 286 |
| | | ladder (lya'pi) | 531 |
| | | crab design (ne' pilya) | |
| | 25 | lya'tena (the palm-wood steps of a ladder) | 552 |
| | | ne' pilya tyūndyū tci lara (ne' pilya signifies crab design; the remainder of the term is untranslatable) | |
| | | ladder (lya'pi) | |
| | | crab design (ne' pilya) | |
| | | tcū'mbi delam ha'"ta (tcū'mbi signifies belt; the remainder of the term is untranslatable) | |
| | 26 | lya'tena (the palm-wood steps of a ladder) | |
| | 27 | crab design (ne' pilya) | |
| | | nim bi'lya (untranslatable) | |
| | 28 | ka'pū tci lara (to turn the eyes in an upward direction) | |
| | | lya'tena (the palm-wood steps of a ladder) | |
| | 29 | delam ha'"ta (untranslatable) | |
| | | lya'tena (the palm-wood steps of a ladder) | |
| | 30 | crab design (ne' pilya) | |
| | 31 | zigzag (dī'tcū). (The connection seems doubtful) | |
| | | The stick used to apply face-paint; it is called mū'pitcipapa, mūpi ke'nū tcipapa, and mū'pi kenū tcipapa, all variants of the same term | |
| | 32 | crab design (ne' pilya) | |
| | | nim bi'lya (untranslatable) | |
| | | crab eyes (ne' kapūka) | |
| | 33 | zigzag (dī'tcū) | |
| | 34 | crab design (ne' pilya) | |
| | 35 | No interpretation obtained | |
| | 36 | No interpretation obtained for this design as a whole. Horizontal bars of this kind are called lya'tena, meaning the palm-wood steps of the house ladder, and the small rectangles are called ne' pilya, signifying crab design, or nim bi'lya, in which nim is a term of unknown signification | |
| | 37 | crab design (ne' pilya) | |

**3: Barrett E-5 (1908-1909)1925**

**SD6 Cayapa SD6**

286
531
552

[372]

| Plate | Figure | |
|---|---|---|
| CXXVIb | 37 | crab design white cotton (ne' pilya fihañ titcila) |
| | | nim bi'lya (untranslatable) |
| | | crab design technic (ne' pilya decima) |
| | | eye (kapü'ka) |
| | 38 | eye (kapü'ka) |
| | | crab eye (ne' kapüka, ne'lü kapüka) |
| | | dü'lalara kapüka, kapüka dala'la ke'tü (kapü'ka in each of these terms signifies eye. The remaining portions of these terms are untranslatable) |
| | | balya'lyac (untranslatable) |
| | | belt design (tcü'mbü pilya). (This term belt applies equally to all designs occurring on belts) |
| | 39 | No interpretation obtained. Horizontal bars of this kind are usually called lya'tema, which signifies the palm-wood steps of a house ladder. As a matter of fact the design from which this figure was taken was a very small one and it is doubtful if this name would apply |
| | 40 | zigzag (dü'tcü) |
| | | i'clabü'ñ (iron used with flint in striking fire) |
| | 41 | i'clabü'ñ (iron used with flint in striking fire) |
| | 42 | i'clabü'ñ (iron used with flint in striking fire) |
| | | zigzag (dü'tcü) |
| | | The rectangular closed figures are called kü'tca peti; kü'tca signifies dog, but pe'ti is untranslatable. The crossed lines between these rectangular figures are called pala'la, a term of unknown signification |
| | 43 | i'clabü'ñ (the iron used with flint in striking fire) |

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

## GLOSSARY OF MANTA DESIGN NAMES

286
531
562
177
104

**bait**, karna'da. Also said to be the name of a certain crustacean, called in Spanish camaron brava. cxxiv, 55.

**balya'lyae** (untranslatable). cxxiii, 11; cxxvi, 1, 3, 4, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 23, 29, 32, 34, 35, 41, 43; cxxvii, 38.

**basket.** See pü'te.

**belt or girdle**, tcü'mbi, a term that may be used as part of the name of any design on a belt. cxxv, 44; cxxvi, 16, 17, 21, 28, 42; cxxvii, 21, 38.

**bird**, pi'tcü. cxxiv, 20, 23, 24, 29, 31, 43; cxxv, 6, 10, 13, 14.

la'pi'tcü. A small black and yellow bird, a good singer, much kept as a pet by the Cayapa. Spanish, pichichu. cxxiv, 64.

tü'mbütcüdü. A small black bird with red beak. cxxiv, 39.

frigate bird, nyamüdwa'tü. cxxiv, 34.

**boa constrictor**, we'sü. cxxvii, 1.

**burro**, bü'rü. cxxiv, 11.

**buzzard**, [illegible], petyü'tyü; Spanish, gallinaso. cxxiv 26, 64.

**canoe design**, küm bi'lya: küm, from kü'lo, canoe. cxxvi, 46.

**centipede's hand**, se'pinde tyapa; hand (not leg) = tyapa'pa. cxxiv, 57; cxxvi, 49.

**chicken**, walya'pa. cxxiv, 26, 37.

**color.** Frequently an informant gave as the name of a particular design the name of the color of the material from which it was made. Such names, of course, have no significance in the interpretation of designs, but are of interest in that often they were the only ones obtainable. The names particularly used in this connection were:

te'nda, green thread, from a small shrub called te'nda tü, the leaves of which provide the pigment used in coloring this thread. [386]

ha'bü, lavender thread, this color being obtained from a small periwinkle-like mollusk.

The names for other colors were almost never used in this manner.

**cow**, vaga'ra, from Spanish vaca. cxxiii, 35; cxxiv, 10, 15.

**3: Barrett E-5 (1908-1909)1925**

**SD 6 Cayapa SD6**

286 **crab,** ne'lū, the small red land-crab. cxxiii, 38; cxxiv, 55, 56, 58.

531 tepui ne'lū, a certain species from the coast region. cxxiv, 55.

552 **crab eye,** ne'kapūka, ne'lū kapūka. This refers to the eye
177 of the small red land-crab called ne'lū. cxxvii, 32, 38.

104 **crab design,** ne' pīlya: ne from ne'lū, crab; pī'lya, design. cxxvii, 12, 24, 25, 27, 30, 32, 34, 37.

ne' pīlya tyūndyū tci lara: ne' pīlya, crab design; the remainder is untranslatable. cxxvii, 24, 25.

**crab design technic** (literally), ne' pīlya decima. cxxvii, 37.

**crab design white cotton** (literally), ne' pīlya fīhañ ūtcūa. cxxvii, 37.

**cross,** karū'sa, from Spanish cruz. cxxvii, 20.

**deer,** ma'na. cxxiii, 40, 41; cxxv, 8, 9, 10, 12, 13.

**delam ba''ta** (untranslatable). cxxvii, 29.

**design.** In many cases informants simply gave the term pī'lya, or bī'lya, which signifies design or pattern. It would appear that it was employed in cases where the design was of unknown signfication, or where it was newly introduced. Such a general term is, of course, applicable to all patterns.

*belt design,* tcū'mbi pīlya. This term applies to any pattern on a belt or girdle, regardless of its form. cxxvi, 10; cxxvii, 38. See belt.

*horizontal design,* de''pañ bīlya. cxxvi, 13.

**dog,** kū'tca. cxxiii, 45; cxxiv, 7, 19; cxxv, 12.

kū'tca petī: pe'tī is untranslatable. The rectangular figures of this pattern are referred to by this name. cxxvii, 42.

**dove,** Spanish, paloma. cxxiv, 29, 31.

pactū'kū. A reddish species as large as a chicken. cxxiv, 25.

wa'pū'pū. A small reddish species. cxxiv, 24, 42.

**duck,** Spanish, pato. cxxiv, 38.

**dū'lalara kapūka** (dū'lalara is untranslatable; kapū'ka, eye). cxxvii, 38.

**ear,** pū'ñge. cxxvi, 49.

**egret,** white, ka''tsū; Spanish, garsa. cxxiv, 45, 29.

**e hū''la** (e, big; hū''la, untranslatable). cxxvi, 5; cxxvii, 7, 10.

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

**e hü'rülara** (e, big; the remainder is untranslatable). CXXVII, 2. 286

**e pala'tcü** (e, big; the remainder is untranslatable). CXXV, 36; CXXVII, 1. 531

**eye,** kapü'ka. CXXV, 17, 23, 27, 32; CXXVII, 5, 23, 37, 38. 552

kapüka dalalake''tü (kapü'ka, eye; the remainder is untranslatable). CXXVII, 38. 177

ka' kapüka, "little eye." The small diamond-shape designs on mantas, etc. CXXV, 23, 27. 104

ka'püka ya dëtcü (kapü'ka, eye; the remainder is untranslatable). CXXVII, 5.

ka'pü tci lara, to turn the eyes in an upward direction, i.e., to look decidedly upward. CXXVII, 28.

**feast table,** pa'kigi, a contraction of pihka kiki. CXXV, 20.

**fruit,** all classes, pü'ka. CXXVI, 41.

**girdle.** See belt.

**goat,** tci'bü; Spanish, chivo. CXXIII, 26, 27; CXXIV, 9, 36.

**guinea pig,** a''tse. CXXIV, 1, 2, 3, 4, 5, 6, 8, 10, 11.

**handkerchief,** te'mbü balya'lya: te'mbü, a contraction of tembü'pü, handkerchief; balya'lya, untranslatable. CXXIV, 21; CXXVI, 47.

**handkerchief design,** te'mbü pilya: tembü'pü, handkerchief. CXXIV, 21; CXXV, 39; CXXVI, 8, 9, 14, 30, 31, 38, 40, 44, 46, 47.

**hawk,** hüya'lyü; Spanish, gabilan. CXXIII, 41.

**hö'lara** (untranslatable). CXXIII, 26, 43; CXXVII, 10.

**horse,** kawa'lyü; Spanish, caballo. CXXIII, 24, 25, 26, 27, 30, 31, 33, 34, 36, 37; CXXIV, 7, 14, 21, 28, 36; CXXV, 8, 14.

**hü''la** (untranslatable). CXXIII, 17, 21; CXXV, 32, 35, 38; CXXVI, 2, 3, 4, 6, 22; CXXVII, 3, 5, 6, 7, 8, 10, 11, 15, 17.

**hü'lara** (untranslatable). CXXVI, 9.

**human being,** tca'tci. CXXIII, 1, 2, 3, 4, 5, 6, 7, 8, 12, 13, 14, 15, 16, 19, 24, 28, 30, 43; CXXIV, 5, 6, 17; CXXV, 1, 2, 10.

**hü'rüla** (untranslatable). CXXVII, 5.

**hü'rülara** (untranslatable). CXXIII, 17; CXXV, 32, 35, 38; CXXVI, 2, 3, 4, 6, 22; CXXVII, 3, 5, 6, 8, 10, 11, 15, 17.

**hüe'bü** (untranslatable). CXXIV, 22.

**kü'tca pe'ti** (kü'tca, dog; pe'ti, untranslatable). The rectangular figures of this pattern are thus referred to. CXXVII, 42

**ladder,** lya'pi; Spanish, escalera. CXXVI, 23; CXXVII, 24, 25. lya'tena, i.e. palm-wood steps of a house-ladder. CXXV, 15, 44; CXXVI, 10; CXXVII, 24, 25, 26, 28, 29.

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

266
531
552
177
104

**lizard.** cxxiv, 13.
bimbú'ka, a large species; Spanish, pianda. cxxiv, 50; cxxv, 36.
bi'mbú nagipú, i.e., egg of a lizard called bimbú'ka. cxxvi, 1, 3, 6, 22.
bi'mbú nyapa, foot of a lizard called bimbú'ka. cxxvi, 5.

**monkey.** cu'ri, a small species; Spanish, machín and mico. cxxiii, 22, 23, 29, 31, 39; cxxiv, 16; cxxv, 3, 4, 5, 6.
wu'cú, wa'cú, a species larger than the machin but smaller than the large black monkey called mongon; Spanish, mono. cxxiii, 22, 39, 45.

**ne'lü kapüka.** See crab eye.

**nim bi'lya** (untranslatable). This design is one of those most frequently employed. cxxviii, 12, 27, 32, 37.

**pala'cia** (untranslatable). cxxvi, 42; cxxviii, 21.

**pala'e lara** (untranslatable). cxxvi, 11.

**pala'la** (untranslatable). cxxiii, 9, 10; cxxviii, 14, 42.

**pala'lae** (untranslatable). cxxviii, 8.

**pala'lara** (untranslatable). cxxvi, 30; cxxviii, 14.

**pala'ra** (untranslatable). cxxv, 30.

**pala'trü** (untranslatable; the only definition obtainable was the Spanish term garavata). cxxiii, 21; cxxv, 20; cxxvi, 49, 49; cxxviii, 14, 19, 20.

**palü'e lara** (untranslatable). cxxvi, 44.

**pelican.** nano'ka; Spanish alcatraz. cxxiii, 38, 42; cxxv, 21, 25, 26, 27, 29, 30, 33, 35, 36, 37, 39, 40, 41.

**petyü'tyü.** See buzzard.

**pilya dü'wa:** pi'lya, design; dü'wa, possibly related to de'trü, zigzag. cxxv, 31.

**pitigua.** etcüm bi'ü: probably related to te'tcümb i'lya, from te'tcüa, pitigua, and bi'lya, design. cxxv, 21.

**pü'ka ka** (untranslatable). cxxvi, 3, 4.

**pü'te wilü'cia:** pü'te, hamper-shape basket; wilü'cia, untranslatable. cxxvi, 22.

**ray.** tongue of sting-ray, tyü'wi ni'ka. cxxv, 34.

**scorpion.** alaga'ra; Spanish, alacrán. cxxiv, 40, 50.

**se'raü dü'trü** (untranslatable). cxxv, 22.

**sheep.** bäretí'gü, usually called bäretí'gü by the Cayapa, but called also üi'ca from Spanish oveja. cxxiv, 1, 4, 5, 6, 8, 16.

**snake.** pind. cxxv, 21.

**spider.** nü'nde; Spanish, araña. cxxiii, 12; cxxiv, 46, 47, 49.

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

**steel**, i'cliahi'ñ, i.e., iron used with flint in striking fire. cxxviii, 22, 40, 41, 42, 43. 286

**stick**, with which achiote face-paint is applied, maf'pitchpapa, malpi be'nü tiñpapa, mã'pi kendi tiñpapa. cxxvi, 29; cxxviii, 31. 551 552

**tagüi'lyü** (untranslatable). cxxvi, 19. 177

**tcü'mbi dekam ba"ta** (tcü'mbi, belt or girdle; dekam ba"ta, untranslatable). cxxviii, 23. 104

**technic**, ba'ndiles, a certain basketry technic. cxxviii, 3, 4, 9, 12, 13.

**te'pu baiyu'lya** (untranslatable). cxxvi, 11, 41.

**toad**, sa'pö, from Spanish sapo. cxxiii, 4, 17, 18, 19, 20, 39.

**top**, trombe'ta, from Spanish trompo. cxxviii, 20.

**turkey**, domestic, kastelya walyapa, literally Spanish or Castilian chicken. cxxiv, 22.

**turtle**, pitsi'li; Spanish, tortuga. cxxiv, 12, 34, 39; cxxvii, 13.

**tyüliya'lya** (untranslatable). cxxvi, 22, 28, 29, 30, 31, 38, 40, 44, 45.

**tyüm bi'lya** (tyüm, probably from te'tüm, pinigua; bi'lya, design). cxxv, 20; cxxvi, 29, 32; cxxviii, 2.

**tyü'mdyü tei lara** (untranslatable). cxxiv, 17; cxxvi, 7, 8, 9, 10, 12, 13, 45; cxxviii, 24.

**zigzag** (generic), dë'tcü. This term is usually preceded by an adjectival term which indicates the particular kind of zigzag; viz., ë'dëtcü, sa'nä dëtcü, fyü'mi dëtcü, de"padeni dëtcü. cxxv, 15, 16, 17, 19, 20, 23, 25, 26, 28, 29, 30, 31, 33, 34, 35, 37, 41, 42, 43; cxxvi, 21, 41; cxxviii, 4, 11, 12, 31, 33, 40, 42.

*dë'tcü serali tsila*; (dë'tcü, zigzag; no definite translation for the remainder of the term could be obtained). cxxv, 29.

*ë' dëtcü*, literally, big zigzag; given also as crossed zigzag, though this meaning is doubtful. cxxv, 18, 27, 32, 40; cxxvi, 3, 10; cxxviii, 1, 22.

*de"pani dëtcü, de"padeni dëtcü*, horizontal zigzag. cxxv, 34.

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

## GOVERNMENT

629 [77 34] In large measure the mode of government now in vogue among the Cayapa is based on the Spanish system at present employed in Ecuador; consequently we find in each of the three divisions of the Cayapa the following officials: Gobernador, secretario de la gobernación, teniente político, alcalde, comisario, capitán, sargento. The office of each of these officials is hereditary and on the death of the incumbent passes to his eldest living son or, if he has no sons, to his eldest living brother. In case he has neither son nor brother, the office passes to the eldest son of his eldest deceased brother, and should no such son be living, it passes to the eldest of his nearest male relatives, thus keeping the office always within the family. This system of succession is obviously an aboriginal one and was naturally retained when the new form of government was engrafted upon the old.

It sometimes happens that the hereditary candidate for an office does not wish to assume it. In such event it passes to the next in line in the order mentioned, or, by common consent of the heads of the related familes concerned, it may pass out of this order. Ordinarily such a condition does not arise, but instances have been known where an hereditary candidate declined to accept an office to which he was legally entitled, and which it was not only his privilege but also his duty to accept.

[77] The Spanish form of government has existed for many years, so that it is now difficult to determine exactly what the aboriginal Cayapa government was. It would appear, however, that there were but three classes of

officials: First, a chief, known as θ'nyi or θ'mi, and now gobernador; second, one or more sub-chiefs, casawa'lyi, now called gobernador nuevo; third, a class which might be termed officers of the law, called tca'itala. All the officers of the present Spanish form of government, other than the gobernador and the gobernador nuevo, are classed under the last head, and in reality all serve the same purposes as did the ancient tca'itala. 622 624

The center of government inheres in the chief, no matter where he may reside, and practically all matters, but especially matters of importance, are referred to him. 622

The Cayapa are separated, geographically and politically, into three divisons, each with its section of the river and its particular village which is used only at times of fiestas or for other gatherings. These divisions are those of Punta Venado, Sapayo Grande, and San Miguel, these designations being taken for convenience from the names of their respective villages in the order in which they are met in going up the Rio Cayapas. A part of Punta Venado is shown in pl. VIII, while a distant view of the village from the river is shown in pl. IX. This is the largest and most important of the three villages. In pl. X is presented a view of a part of Sapayo Grande, with the chief's house in the left foreground. 634

In each of these villages the chief has a large house, and it is here that most matters of importance are settled, justice is dispensed, and punishment inflicted. In such a house there is a large special room, at one end of which is a heavy stocks for the confinement of prisoners when necessary. In the Cayapa country the stocks is strictly 681 [622] [344]

In the Cayapa country the stocks is strictly
681 a Spanish institution, so far as can be learned, and has
177 no Cayapa name, but is always called by the Spanish
term cepo, or, as it is rendered locally, se'pö. So far as
known it was introduced among the Cayapa by early
missionaries.

622 In speaking of ceremonies (page 392), detailed descrip-
tions are given of the methods of punishment, which
theoretically is meted out only by the chief and the sub-
[624] chief. The remaining officers of the government, how-
ever, take a hand in the actual punishment when asked to
do so by the chief, though their special duty is to appre-
hend and bring the offenders to justice, to keep order
at fiestas and other gatherings, and generally to execute
the laws devised by the chief, whose authority is supreme
and whose word in all matters is absolutely binding.
His attitude, however, is in no way oppressive; on the
contrary, he displays great deference to public opinion
and conducts the affairs of government in a harmonious
and satisfactory manner. Perhaps the operations of the
Cayapa governmental machinery are shown to best
advantage in the settlement of what may be termed civil
difficulties, for, as has been previously pointed out,
[674] there are few fixed laws among the Cayapa, largely for
the reason that few crimes are committed. The laws are
517 more in the nature of canons of ethics than statutory en-
671 actments, and they may be varied to a certain extent by
public opinion concerning the particular case in hand.
674 The Cayapa maintain that they have no punishment for
theft, because theft does not exist either among them-
selves or against their neighbors. This reputation is
borne out by the whites and negroes of the region, who

**3: Barrett E-5 (1908-1909)1925**
**SD 6 Cayapa SD6**

declare the Cayapa absolutely honest. It is claimed also that murder and other major crimes are entirely unknown among them. 679

On the other hand, there are strict rules with respect to marital relations, any infringement of which meets with severe punishment. The details of this phase of Cayapa life will be discussed in dealing with the subject of marriage. The Cayapa themselves claim that in aboriginal times the same regulations in respect to these matters were in vogue, but presumably they may have been at least strengthened, if not considerably influenced, by the rigid church laws introduced by missionaries. 684 [177]

It is said that formerly, when the Cayapa were a united mountain people residing in a village community, there was but one chief and one government for all, but that soon after they settled along the banks of the river they became segregated into the three divisions as above mentioned. There then arose the three separate villages for fiestas and other gatherings, and the three separate and independent governments. No special reason for this separation is given by the Cayapa, other than that it was more convenient than to have a single central government; and no explanation could be obtained as to how the officials of the three separate governments were first appointed or elected. 173

It is said that in aboriginal times the inauguration of a new official was attended by no special ceremony, but that he automatically assumed the duties of his office on the death of his predecessor. At present, however, such a person enters on these duties only after having been duly inducted by the priest during his annual visit to the 622 679

**3: Barrett E-5 (1908-1909)1925**
**SD6 Cayapa SD6**

622 village. The successor of an official is definitely known
624 long before the death of the latter, but an official vacancy
is not actually filled until the coming of the priest.
Then, in the presence of all the other officials and anyone
else who may wish to be present, the priest delivers an
address in which he names the new official, announces his
duties and privileges, commends him to the respect of
the people, and charges him with the duties and responsibilities
which he is about to assume. On the death
of the chief, for instance, his duties are relegated to some
other official, usually one of the "alcaldes," until such
time as the priest shall arrive and inaugurate a successor.

465 None of these officials are supposed to receive com-
682 pensation other than the honor and respect in which they
681 are held. The chief, however, usually levies fines upon
offenders, of which he takes personal possession and
could, if he so desired, use a portion of them for his
private needs, since no special account of such matters is
kept by anyone. As a matter of fact such a thing rarely
or never happens; on the contrary the chief uses the
fines for paying the services of officers of the law whom
he may send on missions of various kinds, such as bring-
ing culprits to justice, settling disputes among his people,
[756 and the like. A portion of the money he uses also for the
776 payment of shamans whom he employs now and then
796] to expel dangerous spirits from his village, from deep
pools in the river, or from other places where these
mysterious beings are supposed to endanger the lives of
[636] the people at large. At the present time, when coins of
Ecuador and Colombia are comparatively easy to obtain,
fines are paid in money, but in earlier times they
were always paid in commodities.

## BIRTH

Contrary to the conditions prevailing among many 846
aboriginal peoples, among the Cayapa there are few
restrictions associated with birth. Parturition is usually 844
in a more or less erect position, the woman sitting upon a
low stool of the type shown in pl. LXXXIII,[3a] and no medi- [278]
cines are taken, excepting sometimes a small glass of hot,
strong rum. The woman is attended by other women of 846
her family, but submits to no ceremonial restrictions;
indeed the only prohibitions to which she is subject are
those against bathing, and eating meat. She lies still
for a period varying from a day to about a week, but
during this time and subsequently she may prepare any
food she desires, may feed herself, comb her own hair,
touch her own face, and perform various other acts which
are forbidden under like circumstances among many
other aboriginal peoples.

Couvade, which is so rigidly observed among many South American tribes, is not practised here. In fact, during his wife's confinement a man appears to be entirely unrestricted: he follows his usual pursuits, and even hunts and fishes, two occupations which by a great many tribes are especially forbidden to fathers of new-born children.

With respect to the new-born child itself certain 844
customs are observed. Much care is taken in connection with the umbilicus and the placenta. The cord is cut at a distance of three or four inches from the body, and the end is dipped in hot grease and securely tied. The afterbirth is immediately wrapped in leaves and is

[3a] [ P. 159(8), Cat. 116 -- Analyst]

844 either carried far into the hills and there deposited in
some lonely, out-of-the-way spot, or it is placed to dry
in the upper part of the house for about a month, when it
may be thrown away in a place where no one is likely
846 to find it. When the umbilicus finally sluffs from the
body, it is kept in the house for a month or so and also
thrown away in some secluded spot.

844 This great care that no one shall come upon either the
846 umbilical cord or the afterbirth is apparently not due to
fear that the child or a member of its immediate family
will be injured if either should be found, but it is claimed
that the magic effect upon a person encountering either
would be very serious, and might even result in death.
[754] No evidence could be obtained that would point to the
use of either the umbilicus or the placenta by shamans
or others for bringing about magic spells or other
malevolent effects.

844 Immediately after its birth, the child is bathed in warm water and its entire face is painted with red achote, but neither the child nor the mother is obliged later to undergo any purification or other ceremony.

## NAMES

553 According to their profession of the Roman Catholic
faith the Cayapa baptize their children for the first time
within a few days after birth. This first rite is per-
553 formed by a man and a woman, special friends of the
608 family, who are selected by the parents. If the child is
a boy, he is held by the man who is to become his god-
father while the woman who is to become his godmother

3: Barrett E-5 (1908-1909) 1925
SD 6 Cayapa SD6

baptizes him with a tumbler of water as she gives him his 553
name, which is almost invariably the given name of the 608
godfather. If a girl, the child is held by the godmother, baptized by the godfather, and given the name of the godmother.

A child may be, and usually is, called by its first 551
baptismal name, but sooner or later in its babyhood some act or circumstance connected with its life will appeal to the members of the family as particularly ludicrous or interesting. Its name is thereupon changed, it being 551
called by the name of this act or circumstance to the 553
almost total exclusion of its baptismal name. At the first opportunity the child is baptized by a priest, and then receives from him its true Christian name, which is usually that of the patron saint of the day upon which the child was born. Some months, however, may elapse before this second christening, since it is possible to have such a baptism only when a priest makes a visit to the region or when a part of the family has occasion to go to Esmeraldas or to some other point where a priest resides. In spite of the fact that the child may now have two 551
Christian names, it almost invariably happens that some nickname given to it in the nature of a joke clings to it, perhaps for the rest of its life, and always at least until after marriage. This nickname may at any time be changed according as some new propensity is displayed by the child, or some new incident occurs which appeals to its associates or to the family.

Such a nickname persists usually until the person be- 551
comes a father or a mother, when the name is immediate- 553
ly changed and the person is no longer known by his or

551/ her original name, but as the father or mother of this
553 first-born child. Thus, the chief of the Punta Venado division of the Cayapa is known by the Christian name Antonio Napa, but is almost invariably called pi'tcû-apa, signifying "father of pi'tcû." Correspondingly his wife is known as pi'tcû-ama, "mother of pi'tcû." Such a name usually persists regardless of the names of any of the younger children and regardless of whether or not the eldest child still lives. In the case cited, the eldest son, pi'tcû, died several years ago and there are several younger children in the family, but the names pi'tcû-apa and pi'tcû-ama still persist. Now and then a person is found whose original nickname is used even after the birth of his children, but this is very exceptional.

## PUBERTY

881 As in the case of birth, there appear to be almost no restrictions upon or ceremonies for either sex on reaching puberty, which is again contrary to the customs of most aboriginal peoples. Some even maintain that there are absolutely no restrictions, but others claim that girls at the age of puberty are prohibited for a short period
[841] from going about and from bathing. This latter statement seems the more probable, in view of the fact that during their menstrual periods the older women are subject to the same restrictions, though they are not otherwise restricted in their actions at such times.

D

## MARRIAGE

When a young man or a young woman desires to marry 584
a certain person, all work other than that absolutely
necessary, and all social relations with other individuals,
are at an end. Such a person sits throughout the day
without speaking to anyone, and no matter how much he
or she may be addressed or made fun of, etiquette does
not permit such a person to respond or even to laugh.

It sometimes happens that a young man is desirous of
marrying a woman who cares nothing for him. In such [832]
a case, if his ordinary endeavors to gain her interest and
attention fail, he resorts to the use of certain sweet-scented
herbs, the woods of certain trees, and various
other objects, which are supposed to have magic power
to attract and to give him good luck in such matters.
He wears such charms about his person, especially attached
to his necklaces.

A young man in love bides his time until the other 583
members of his family have retired for the night, when 584
he takes his canoe and paddles to a point near the house
of the young woman he wishes to marry. On nearing [583]
her home he sings softly certain magic love-songs and
then cautiously approaches the house. He then, according
to some informants, attracts her attention by
one means or another and endeavors to persuade her to
leave the house with him for a time. According to
others, he cautiously enters the house and passes a part
of the night with her under her own mosquito canopy.
In either case they part toward morning, so that the
lover is able to return to his own home without the

583 knowledge of his family. These visits are repeated for 584 some time, when the young couple announce their desire to marry and obtain the consent of their respective parents. After this, conditions very largely govern their procedure. By some it is said that at present they go immediately to the house of the bride's or the groom's father, or to a new house of their own as soon as one can be built, and there live as man and wife without any 585 special ceremony; indeed the only ceremony celebrated is that of the church on the next annual visit of the Catholic priest. Others maintain that, having obtained the consent of all parties concerned, some time elapses before what may be called the preliminary wedding feast and ceremony. In this interval the young man and his friends must hunt and procure game, which is dried for the feast, and must provide presents for the parents and other relatives of the bride. The bride, on the other hand, provides certain of the other foods, such as plantains and corn, and she and her family make gifts to the family of the groom. There is no exchange of presents between the bride and the groom, however, and there is nothing which can in any way be construed as a purchase of the bride. Finally the relatives and friends of the contracting couple assemble, and a feast of from one to two or three days is held. At this feast the young couple are brought in and are given each ten lashes with a cat-o'-nine-tails by the chief. This whipping is considered as a consummation and legalization of their 585 marriage, so far as civil procedure is concerned. It seems probable that this custom is a survival of aboriginal 177 times and that the marriage ceremony has not been so

greatly modified by intrusive religious ideas as have 585
many other features of Cayapa culture. With the coming 177
of the priest, on the occasion of his annual visit, the
regular church marriage rite is performed. At this
ceremony there is further chastising of the contracting
parties by the chief or by some one delegated by him.

On the occasion of the annual visit of the priest to one 585
of the Cayapa pueblos, usually in August or September, [527]
a fiesta of from one to three weeks is held, during which
it is customary for couples who have been married
between the time of the priest's last visit and the present
occasion to celebrate a marriage feast. Should it be
inconvenient to celebrate the marriage feast at this
particular time, it may be held at any other gathering
of the people at the village, or it may even be deferred
until the next annual visit of the priest. These marriage
feasts are the occasion of much merrymaking. Quantities
of food, rum, and tobacco are provided, and the
whole village celebrates for a day or two. During [252]
the forenoon of the first day, a table, made by spreading
upon the floor of the large assembly and dance hall of
the chief's house a covering of hoja blanca, is filled with
all kinds of food, among them being one special dish of
eggs, prepared much after the manner of scrambling.
At this feast a most exceptional departure from the rule 585
of the separation of the sexes at public gatherings is 527
observed. At all other feasts, men and boys only are
permitted to enter the room in which the feast is held,
but on this occasion the bride and her godmother are
present. The mother of the bride, however, does not 585
enter. Another interesting feature of this feast is that,

585 other than the bridegroom and his godfather, and the bride and her godmother, all of those seated at the table are the heads of families. At the head of the table are seated the chief and three or four others of the principal
585 officials. Along the side of the table and immediately
608 to the right of these officials are seated, in order, the godfather of the groom, the groom, the bride, and the godmother of the bride. The rest of the places on both sides and at the foot of the table are occupied by the heads of the families attending the feast. It should be noted that this godfather of the groom and this godmother of the bride are not usually the same as the godfather and the godmother arising from the baptismal relationship above described, but are usually persons somewhat older than the contracting parties and act as sponsors for the two, much as do the groomsman and the bridesmaid among civilized peoples.

585 One of these wedding feasts witnessed in 1908 proceeded as follows: After the usual church invocation, which is always pronounced at any feast, the chief took up the bowl of scrambled eggs above mentioned and personally served a spoonful to each of the four parties most closely concerned with the marriage—first to the groom, next to the bride, then to the groom's godfather, and finally to the bride's godmother. All those at the table were then at liberty to partake of the other foods of the feast. In addition to the abundance of dried meats and other foods with which the table was laden, pottery plates containing a mush made of ripe plantains and meat were served, one to each person. Everyone ate freely, except the bride and groom, who throughout

the morning had remained one in one room and one in 585
another, each specially dressed for the occasion, and each with a cloth carefully bound so as to cover the mouth. The groom was attended by his godfather, the bride by her godmother, and neither conversed with any other persons. The same silence and covering of the mouth were maintained throughout the feast, and indeed throughout the remainder of the day. Toward the end of the feast, one of the officials delivered an extended address in which he exhorted the bride and groom to live peacefully and helpfully together, and outlined the paths each should follow in order to insure model married life for themselves and a useful career to the community. He especially warned the groom 585
that under no circumstances had he any right or privilege 684
in chastising the bride, but that in case she were to become remiss in any of her duties he was bound to report the matter to the chief or to some other official, whose duty it was to see that she was properly punished. Likewise he was warned that remissness on his part would also be met by the officials with severe castigation.

The feast being ended with the usual benediction, 585
and the floor having been cleared, dancing was next 535
in order. Practically all dancing among the Cayapa consists, as is elsewhere described, of a kind of shuffling step back and forth along a line in the middle of the dance floor. A single couple only participate in one of these sets, the man dancing backward, followed by the woman, and vice versa.

A feature of special note in connection with the wedding dance is the order in which the participants came

585 upon the floor. First, the godfather of the groom, who
at the same time is master of ceremonies, danced with
535 the bride; next the groom danced with the godmother
of the bride; and finally the chief, followed in order of
rank by the other officials, danced with the bride. The
groom danced but once during the day, whereas the
bride was kept dancing almost constantly. She, however
was relieved from time to time by some other
member of her family, who danced in her place for a
few minutes. During all this time the groom sat at one
end of the dance hall with his mouth covered, and conversed
with no one except his godfather, and rarely
with him. During the intervals between dances the
bride sat likewise in silence in an adjoining room. The
dancing was kept up during the entire afternoon and
585 night, with a single brief intermission. During this
301 intermission the bride and groom put on new clothing
and were decked with pendants and necklaces of silver
coins, and with garlands of the yellow flowers so much
used by the Cayapa for decorating the images of saints
in the church.

585 After donning this finery, the groom resumed his place
535 at the end of the hall and the bride continued her dancing,
[373] which lasted till nearly morning. With the coming
of night, light, as usual, was provided in the dance hall
by means of candles, small kerosene torches, and native
[177] torches (al'lyû). Throughout the entire period the
dance had been the simple one used by the Cayapa,
but finally there was danced what is called the "San
Juan," a recent importation from the mountain region
which appears to be more or less, if not entirely, of
Spanish origin.

3: Barrett E-5 (1908-1909)1925

SD 6 Cayapa SD6

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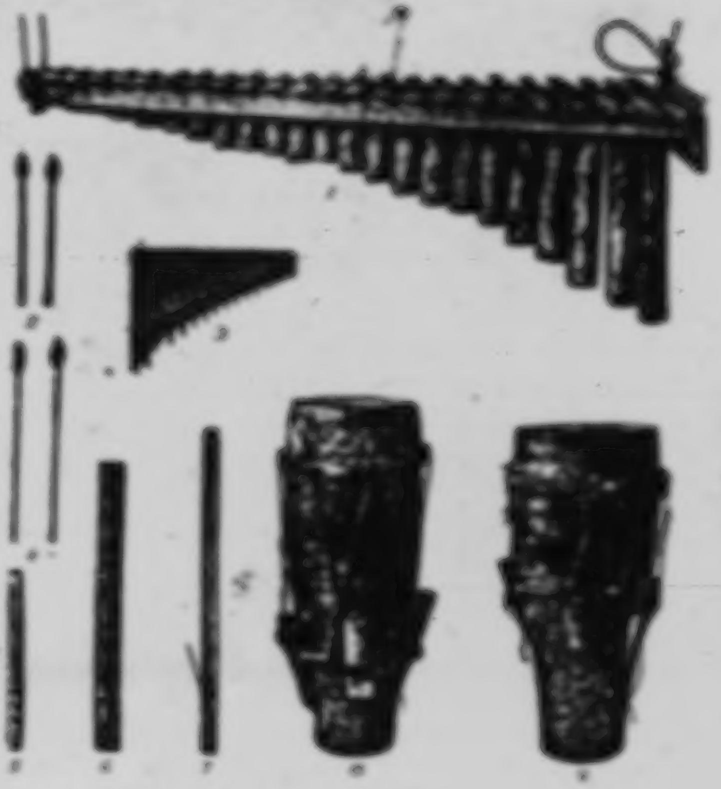

MUSICAL INSTRUMENTS

[p. 326 (II)]

585 In the particular ceremony witnessed on the occasion 535 referred to, at about four o'clock in the morning, four couples danced the "San Juan." The men and the women formed two lines, at the head of which respectively were the groom and the bride; next came the godfather of the groom and the godmother of the bride, while the other couples were those who chanced to be 585 selected for the dance. The music for this is very 533 different from that for the ordinary dance. The ma- 534 rimba was not used at all, and the players of the drums and rattles did not station themselves at the end of the hall near the marimba, but each took his instrument and marched in time to the music up and down and across the hall (pl. CXXVIII). As the musicians and others 585 thus proceeded about the hall, each man exchanged 535 instruments, or hats or other articles of apparel, with [431] whomsoever he met, the latter having no option in this exchange, his duty and privilege being to grasp the instrument or article of apparel from the man whom he next met. Notwithstanding this riot of fun and jollity among the musicians, they played in unison, and the dancers were able to keep their time and step perfectly.

The dance itself proceeded as follows: The two lines, one of men and one of women, danced up to each other and passed to the opposite side of the hall in such manner that each man passed between two women, and vice versa. Having arrived at the wall, they faced about, passed back again, and crossed until this had been done three times and the two lines were left facing each other and in their original positions, one near each side of the room. Next each one of the eight

585 535 danced alone and in turn along a serpentine path in and out of the two lines; that is to say, beginning with the bridegroom, who was at the head of the line of men, the dance proceeded as follows: He danced to the opposite side of the room, around back of the first of the women; then to the men's side of the room and around back of the first man; back again to the line of women and around back of the second woman; then to the men's line, and so on until he had completed this dancing across and back, passing each time around one member of the line, and finally had danced up the middle of the hall and had returned to his place. He was followed in the same manner by the woman opposite him, who in turn was followed by the man next in order, and so on, alternating until all the eight performers had danced in this serpentine manner and had returned to their places. Next, the first couple danced in the same manner, the man being closely followed by the woman. When they had returned to their places, the two lines danced across the room and back in the manner first described. Next, the second couple performed this movement and were followed by the dance of the lines across the room and back. The same cycle was repeated in the case of each of the two remaining couples. Finally, the eight dancers joined hands and circled three times to the right and three times to the left, there being meanwhile one drummer within the circle while the remainder of the musicians continued their
585 riotous march up and down the hall. After this, the men led the bridegroom and the women led the bride to their mosquito canopy, which had been put up in

the adjoining room, and placed the two under it. They 585
were followed to the canopy by the musicians and by all the spectators, the former playing their rattles, beating their drums, and whacking sticks most noisily, and all calling and shouting and making every manner of fun. Having been thus escorted to their mosquito canopy, the ceremony was ended, and the bride and groom were at liberty to remove their finery, appear in their usual dress, and go about without further restriction.

The Cayapa maintain that not only at present, under 582
the influence of the Catholic Church, but also in aboriginal times, marriage between near relatives was strictly forbidden. Even marriage between remote cousins is prohibited. This relationship of cousin, however, is regarded in a way somewhat different from that of civilized peoples. Further in case of the death of a man or his wife, the survivor is prohibited from marrying any other member of his or her family.

Divorce is now strictly prohibited, and the Cayapa 586
maintain that it was unknown even before they came under church influence. It is also held that even before the establishment of the church among them the family relations were as sacred and the family ties as binding as at the present time. Divorce, however, is only a theoretical prohibition. As a matter of fact it does occur 586
at the present time, although very rarely. A man or a 684
woman leaving his or her spouse is, if apprehended, severely punished by the Cayapa officials and every effort is made to force reconciliation. Although sometimes these efforts are successful, cases are known

586 in which, in order to escape the wrath of public opinion
614 and castigation by the officials, offenders against the
divorce laws have left the Cayapa country entirely
and taken up their abode in Colombia or in the interior
of Ecuador. The same applies to the laws relating to
582 marriage between near relatives. The evasion or the
684 open violation of either the laws of divorce or those
governing consanguineal marriage are, however, of
such rare occurrence that the laws may be said to operate
almost perfectly, and they, together with the laws
requiring chastity and fidelity in both sexes, certainly
produce a salutary moral effect on the community. In
fact, it is most exceptional to find a tribe or a community
of the size of the Cayapa in which the ethical standards
are so high and so strictly observed.

## DEATH

761 As was stated in speaking of medicine practices, death
is ordinarily attributed to the presence of malevolent
753 spirits in the body, whither they find their way by various
776 means. For instance, they may be placed by some
[759] malicious shaman in the soul of the individual as it
wanders about during sleep, or they may enter directly
into the body as one passes some particular spot believed
to be infested with these malicious, disease-breeding
spirits.

774 There seems to be a difference of opinion as to the
775 soul. One informant maintained that there are numer-
177 ous souls, each residing in a different part of the body;
that the one in the chest is the largest and most im-

portant and the one which ascends to the sky after 774
death, there to receive its proper reward or punishment. 775
This latter notion, however, appears to have been derived [777]
from modern religious ideas. The various souls residing in other parts of the body were said by this informant to live in and about the house of the deceased until such time as they are driven out. Most informants, on the other hand, maintain that the body has but a single soul, which lives in and about the house of the deceased until driven out to the ocean or into the mountains by a shaman, there to reside eternally. Having once been thus expelled, the soul is never again seen about the house, but it may return to the cemetery or to other parts of the region. It is said to do no special harm to the living after having been driven away, but will cause the death of other members of the family if allowed to remain unmolested about the house.

On the death of an individual the body is dressed 764
in his best clothing and wrapped carefully in mantas or other available cloth; it is then placed in a wooden box made after the fashion of a coffin, or if the wood is not at hand a kind of coffin is made of bamboo.

If death occurs very early in the morning, the corpse may be interred the same day; usually, however, it is kept until the following day. Meantime the relatives and friends living within comparatively easy reach are notified. All who are able, journey to the cemetery, which is but a short distance from the village, and there a Catholic funeral service is held over the remains, after which they are buried in a shallow grave.

Before leaving the house with the body, the relatives prepare for the occasion what might be termed a fence of palm-leaves. A row of palm-leaves is set together vertically along the river-bank in front of the house, the row being sometimes a hundred yards or more in length. Opposite the house and at the point where the path ordinarily used for going to the river crosses the row, one leaf is omitted. When the family departs with the corpse, the head of the house sets in place the leaf necessary to complete the fence, and the house then becomes taboo to all passers-by. No one, not even the negroes of the region, would think of going through or around this fence or in any way approaching the house, owing to their fear of the soul of the departed which is supposed to linger about the house and which would be sure to wreak vengeance upon them. If it has been determined, however, that the relatives of the deceased shall again inhabit the house, they return after the funeral and pass through the fence, but not until the head of the house has removed the single palm-leaf referred to as the one last planted by him. The remainder of the fence is never taken down, but is allowed to fall of its own accord.

768 In many cases such a house is never again occupied. This is true when the deceased is an important member of the family, as the father, mother, or a favorite son or daughter; indeed almost any of the older members of a family are considered sufficiently important to warrant the abandonment of the house. After the death of a young child, on the other hand, a house is almost always reoccupied. The abandonment of a house is a matter of no small importance to a Cayapa family, since its

construction is attended with considerable difficulty, especially in the matter of cutting and adzing the house-posts, which are long and heavy and are made of very hard and durable wood. Furthermore, when a house is abandoned on short notice, other shelter must be found for the family, either by building a temporary structure or by sharing quarters with a relative until a permanent dwelling in a new locality can be constructed. Frequently the move is only a short one; as, for instance, to the opposite side of the river, the fields of plantain and other products being still used. If, on the other hand, the site of the new house is at a considerable distance from that of the abandoned one, new fields and an entirely new equipment are established in a short time. An abandoned house changes very little in appearance for a season, but by the end of a year or two it becomes overgrown with the rank vegetation, and in the course of four or five years is almost entirely invisible. There are instances in which an abandoned house has been sold by the surviving relatives, not to be inhabited where it stood but to be taken apart and the materials transported to a new locality. It rarely or never happens, however, that the surviving relatives themselves will take such a house to pieces and use its materials for the construction of their new home.

In case it has been determined to abandon a house, some maintain that it is never again visited by anyone after the body of the deceased is removed, but others claim that one or more of the surviving relatives return to it with a shaman for the purpose of driving out the soul or spirit of the deceased. As a matter of fact

768 there would be no other reason for returning to it, since when the corpse is taken away all property which the relatives do not care to abandon completely is removed from the house at the same time.

In large measure the property of the deceased is destroyed or disposed of by the surviving relatives. [764] Some of his property, along with some of their own, is usually buried with the corpse. The greater part of the remainder of the property of the dead, and also frequently much of that of the relatives, is thrown into the river, given to other persons, or sold. Ordinarily one or two articles, as for instance a manta or an adz formerly belonging to the deceased, is kept by near relatives, but often there seems to be a definite desire to destroy all evidences of the life of the deceased and to get rid of any articles that would recall him to their minds.

## KINSHIP

601 The terms of relationship among the Cayapa are as follow:

### Ascending Relationship

| English | Cayapa | Equivalent |
|---|---|---|
| father | a'pa | |
| mother | a'ma | |
| grandfather | antc-a'pa | antc-father |
| grandmother | antc-a'ma | antc-mother |
| uncle | yapi'pi, api'pi, api'kû | a'pi-a'pa |
| older than parent | apa-kari'we<br>apikû-rûkû'we | father-kari'we<br>father-kû-old-man |
| younger than parent | ka'i-apipi | little-father-pi |

01

| | | |
|---|---|---|
| uncle's son | apī-na'*t*ala | father-brother |
| uncle's daughter | apī-na'*t*a-tsu'kkī | father-brother-sister |
| aunt[16] | mañgō'kō | |
| older than parent | mañgū'kū-cimbū'we | aunt-old-woman |
| younger than parent | karī'-mañgūkū | karī-aunt |
| aunt's son | mañgō-na'*t*ala | aunt-brother |
| aunt's daughter | mañgō-na'*t*a-tsu'kkī | aunt-brother-sister |

The terms for each of the corresponding ascending relationships through the father and the mother are identical.

### Collateral Relationship

| English | Cayapa | Equivalent |
|---|---|---|
| brother | na*t*a'la | |
| elder brother | ūnya'kō | |
| younger brother | bē'ña | |
| brother's son | apī'-nya | father-son |
| brother's son's son | apī'-nya-na | father-son-son |
| brother's son's daughter | apī-nya-na'ma | father-son-daughter |
| brother's daughter | apī'-na'ma | father-daughter |
| brother's daughter's son | apī-na'ma-na | father-daughter-son |
| brother's daughter's daughter | apī-na'ma-nama | father-daughter-daughter |
| sister | tsu'kkī | |
| elder sister | tsu'kkī | |

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[16] From one informant was obtained the term a'tciū, said to signify both aunt and uncle, and there was also obtained the term *u*ny*u*ny*u*, said to signify aunt. No verification could be obtained for either of these terms, which, combined with the fact that they are so at variance with the whole system of relationship, make them both seem very doubtful.

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

601

| | | |
|---|---|---|
| younger sister | kai-in-tsu'kkī | little-my-sister |
| sister's son | atcī'-nya | atcī-son |
| sister's son's son | atcī-nya'-na | atcī-son-son |
| sister's son's daughter | atcī-nya-na'ma | atcī-son-daughter |
| sister's daughter | ūpū-na'ma | ūpū-daughter |
| sister's daughter's son | ūpū-na'ma-na | ūpū-daughter-son |
| sister's daughter's daughter | ūpū-na'ma-nama | ūpū-daughter-daughter |

## Descending Relationship

| English | Cayapa | Equivalent |
|---|---|---|
| child | ka'ilya | |
| son | na | |
| elder son | awē'-na | big-son |
| younger son | ka'ī-na | little-son |
| daughter | na'ma | |
| elder daughter | awē-na'ma | big-daughter |
| younger daughter | kai-na'ma | little-daughter |
| grandchild[17] | pa'nya | |
| great grandchild | tyū'ī-panya | tyūī-grandchild |

## Relationship Through Marriage

| English | Cayapa | Equivalent |
|---|---|---|
| husband | iñ ru'kū | my-old-man |
| wife[18] | iñ ci'mbū | my-old-woman |
| father-in-law | antc-a'pa | antc-father |

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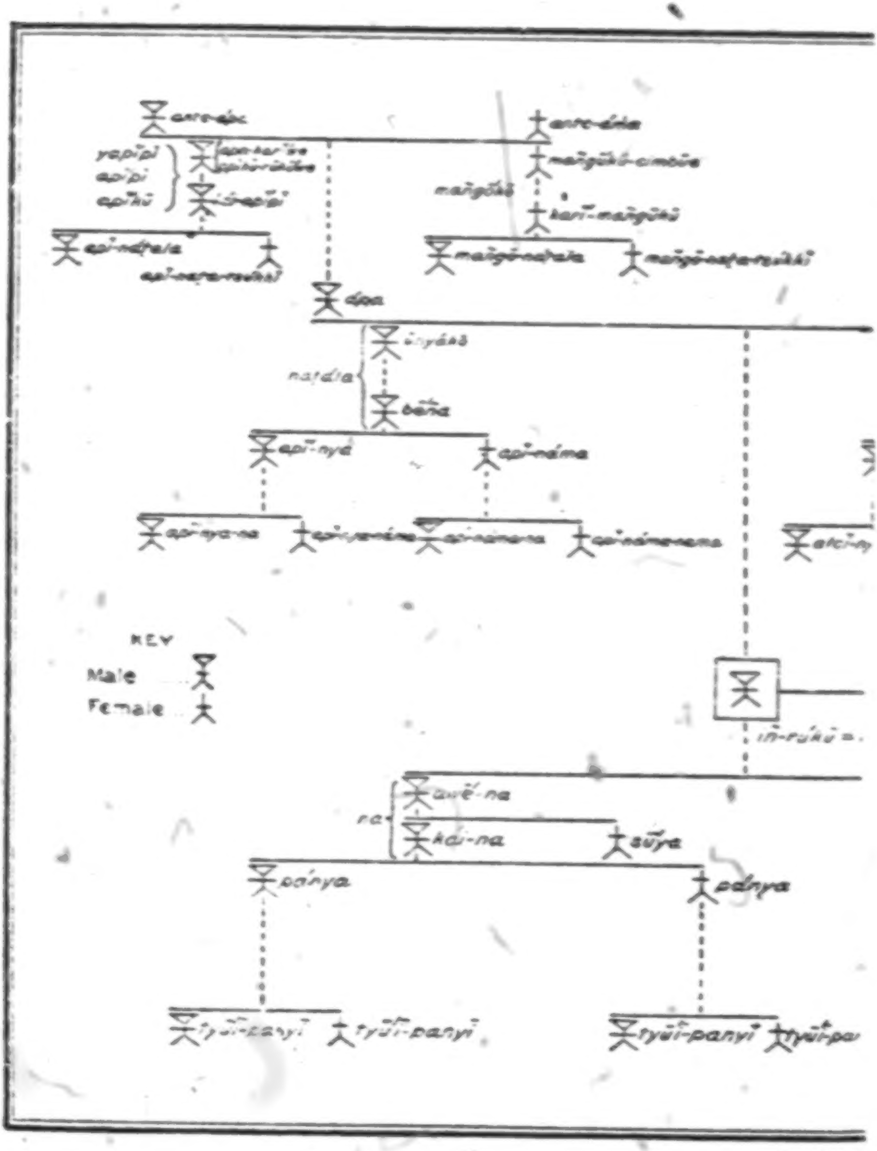
[17] Under ordinary circumstances the simple term pa'nya is used to designate all grandchildren, but there is an indication that more specific terms exist. These terms, according to the particular informant from whom they were obtained, appear to be as follow: son's son, lyūpū-na-pa'nya, or na-na-mīabe; son's daughter, nasūpū-nama-na'-mīabe; daughter's son, nama-na'-mīabe; daughter's daughter, sū'pū-nama-pa'nya, nama-sū'pū-nama-na-mīabe, or na-i'ñ-nama.

[18] The term iñ-tsa'kī was also said to signify wife, but the connection appears to be somewhat doubtful.

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

601


anro-apa
anro-áña
yapipi
apipi
apihü
apintsa-ai'be
apiurrandbe
ánapai
mangükü-cimbüe
mangükü
kari-mangükü
api-natala
api-nafa-rsukki
mangünatala
mangünafa-rsukki
doa
ünyánä
natdla
bäña
api-nyá
api-náma
apinya-na
apinyanáma
apinámana
apinámenama
atci-n
KEY
Male
Female
iñ-ruku-
awë-na
na
kai-na
süya
panya
pahya
tyüi-panyi
tyüi-panyi
tyüi-panyi
tyüi-pa

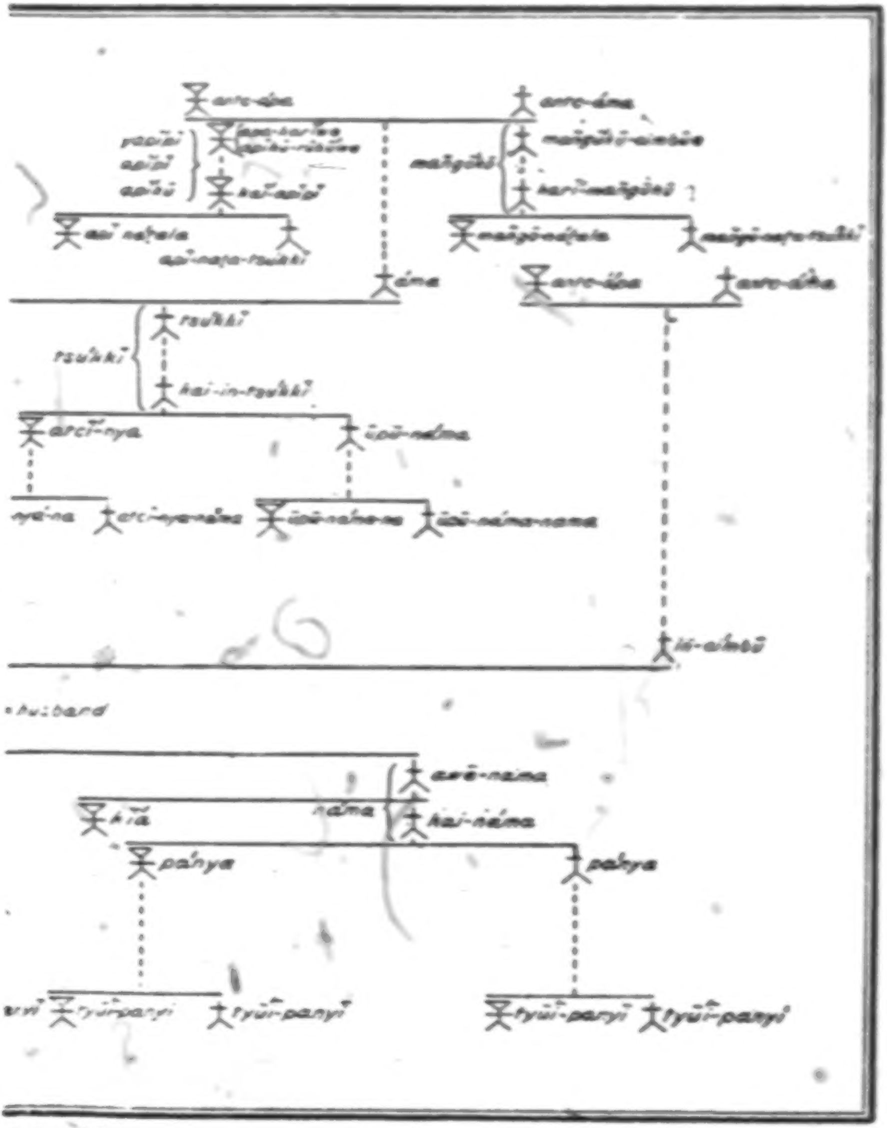
KINSHIP

[P. 336(A)]

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

PL. CXXIX

601


arro-áha
arro-áma
aaiñi
aaiñu
hai-aaiñi
aai nafala
aai-nafa-tsukki
áma
mañgükü
hari-mañgükü ?
mañgü-nafala
mañgü-nafa-tsukki
arro-áha
arro-áha
tsukki
tsukki
hai-in-tsukki
arci-nya
ücü-naima
nyaina
arci-nya-naima
ücü-naina-na
ücü-naima-nama
• husband
awë-naima
naima
hai-naima
kiä
pahya
pahya
tyüi-panyi
tyüi-panyi
tyüi-panyi
tyüi-panyi

P CHART

[p.336(B)]

601

| | | |
|---|---|---|
| mother-in-law | antc-a'ma | antc-mother |
| mother-in-law (term of derision) | a'ia | |
| son-in-law | kī'a | |
| daughter-in-law | sū'ya | |

In pl. CXXIX is given a kinship chart showing graphically the principal relationships among the Cayapa.

## Composition of Terms

### QUALIFYING TERMS

All terms of relationship are preceded by the possessive pronoun, which varies according to the relationship of the person in question to the speaker, to the person spoken to, or to the person spoken of. Thus, in the singular these possessives are iñ, nyū, and ya, signifying my, thy, and his respectively. The full possessive forms are iñ-tcī, nyū-tcī, and ya-tcī, but the -tcī is usually dropped when these terms are used in this connection. The plurals are almost never heard in ordinary use. These, in their full forms, are la-tcī, nyū-tcī, and ya-tcī. In here dealing with the terms of relationship the possessive pronouns are systematically omitted in order to simplify the tabulation and discussion of the terms.

It is a notable fact that, though this possessive relationship between the person in question and the speaker, the person spoken to, or the person spoken of, is always expressed, no other possessive relationship appears in any of the terms. For example, my sister's daughter's daughter is always preceded by the first person possessive, iñ, to establish clearly the relationship of the speaker to the person spoken of, but within the term itself there appear no possessive elements whatsoever. When literally translated, therefore, the term signifies my-sister-daughter-daughter. All other terms which present analogous combinations of elements have similar forms. The only possible exception to this is the term for younger sister kai-in-tsu′kkī, little-my-sister.

In various terms the words son and daughter appear as qualifying elements, being compounded with other terms of relationship. In many of these cases, however, the terms with which these qualifying elements are combined appear to bear no resemblance to those primary terms indicating the same relationship. For instance, brother's son and brother's daughter are apī′-nya and apī-na′ma respectively, but brother is nata′la. The differences in the case of sister's son and sister's daughter are even more striking. These are atcī′-nya and ūpū-na′ma respectively, while the term sister is tsu′kkī. Thus none of these terms shows on its face even a similar form to that of the corresponding simple term for brother or sister.

The words father and mother also appear in the capacity of qualifiers in the terms antc-a′pa and antc-a′ma, signifying primarily grandfather and grandmother, and secondarily father-in-law and mother-in-law.

Elements indicative of size are used in certain terms, especially those in the descending series, as, elder and younger son, which are awē′-na and ka′i-na respectively, literally big son and little son.

The words old-man and old-woman are elements of certain terms. Husband and wife are simply my old man and my old woman, iñ ru'kū and iñ ci'mbū respectively. Uncle and aunt elder than the parent through whom the relationship exists are respectively apīkū-rükū'we (also given as apa-karī'we) and mañgū'kū-cimbū'we, signifying uncle old-man and aunt old-woman respectively.

As is frequently the case, the relationships existing between the children of brothers and sisters is conceived to be the same as that of brother and sister. In this case, however, it is not considered as a simple brother and sister relationship, but the term indicates the person through whom it is traced. Thus, uncle's son and aunt's son are apī-na'*t*ala and mañgō-na'*t*ala respectively, signifying literally father-brother and aunt-brother. It seems possible that the first part of this term aunt, which in full is mañgō'kō, may have been derived from mother, a'ma, just as the basal element of the term uncle is clearly derived from father, a'pa. In the case of aunt, however, the term is now so complex, and the term mother, on the other hand, is so simple, that it is difficult to establish clearly this derivation. If such a derivation is assumed, then the term aunt's son is equivalent to mother-ñgō (untranslatable)-brother.

When the terms uncle's daughter and aunt's daughter, however, are considered, it is found that these are formed by the simple addition of the term sister to the terms signifying uncle's son and aunt's son. These are then literally father-brother-sister and mother-ñgō-brother-sister.

### MODIFYING CONCEPTS

601 The sex of the individual spoken of is indicated in all terms except grandchild and great-grandchild. The sex of the person through whom the relationship to the speaker is traced is carefully maintained in the terms of relationship in the collateral line, and there is some evidence that at times terms bearing somewhat of the quality are used in the descending line, though ordinarily the one simple term indicating grandchild is used for all grandchildren and the one term great-grandchild for all great-grandchildren. In the ascending line, on the other hand, no account whatever is taken of the sex of the individual through whom the relationship in question exists. That is to say, all the relatives through the mother are the same as those through the father. In short, this entire phase of the Cayapa kinship system may be summed up in the statement that (1) the respective relatives traced through the father and through the mother are the same, that (2) the respective relatives traced through the brother differ from those traced through the sister, and that (3) all descendants beyond sons and daughters have the same respective designations.

A rather unusual condition is shown in the terms of the collateral line. First of all the three terms brother, elder brother, and younger brother are entirely different each from the other, while the comparable terms for sister show the opposite condition, being formed on the same base. The terms for sister and for elder sister are in fact identical, while that for younger sister is formed by the simple addition of the term signifying "little."

Proceeding to the terms for brother's children and grandchildren we find them built up on a single basal element, a'pī, which is entirely unrelated to any of the three terms naɬa'la, ūnya'kō, and bĕ'na, signifying brother. It is evidently related to the term uncle, the root of which is a'pī, which in turn appears to be the phonetically altered a'pa, father.

A different condition, however, is found when the analogous relationships through the sister are considered, for here enters what may be regarded as a double sex feature. Sister's son and sister's son's son and daughter are formed on the basal element a'tcī, with the addition respectively of the terms signifying son, son-son, and son-daughter. However, when the term sister's daughter and the terms for her two children are reached, it is found that they are formed on an entirely new basal term, ū'pū, which fact may be considered as indicative of a double sex distinction in the basal term. That is to say, while in the first instance the basal element a'tci is evidently employed with the signification of daughter of the sister of the speaker, it may be employed only when the following elements with which it is combined are those relating to the son of this daughter. If, on the other hand, it is desired to mention in these following elements the daughter of this daughter, a different basal term, ū'pū, is employed. Furthermore, there is no apparent connection between either of these two basal elements and the term tsu'kki, indicating sister. It therefore seems fair to assume that these features of sex which appear in the elements that follow the basal element in these terms may perhaps react on this basal element itself in such manner as to alter it. However, it must be borne in mind that a similar condition does not obtain in the analogous terms that indicate the descendants of the brother of the speaker. Here the basal element is the same in all terms indicating these descendants, though it differs entirely from the three terms for brother.

There are two modes of indicating relative age—one is by the use of augmentatives and diminutives, the other by the use of terms signifying "old-man" and "old-woman." The latter are used in only two terms each. Old-man appears as a part of the term signifying uncle older than parent, apīkū-rūkū′we (also given as apa-karī′we), and in the term husband, iñ ru′kū, signifying literally my old-man. Old-woman likewise appears in the corresponding two terms, aunt older than parent, mañgū′kū cimbū′we, and in the term wife, iñ ci′mbū, literally my old-woman. In only one instance are terms entirely different from the basal one used to indicate relative age. This is in the case of brother, which is na*t*a′la, while elder brother is ūnya′kô and younger brother is bē′ña.

The augmentative a′wẹ̄, meaning big, is used to indicate elder in only two terms, those for son and daughter. The diminutive ka′i, meaning small, is used to indicate younger in the terms for son, daughter, sister, uncle, and possibly aunt.

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

The various terms of relationship in which the element of age enters are as follow:

601

| English | Cayapa |
|---|---|
| brother | na′a′la |
| elder brother | ûnya′kō |
| younger brother | bē′ña |
| sister | tsu′kkī |
| elder sister | tsu′kkī |
| younger sister | kai-in-tsu′kkī |
| uncle | yapī′pī, api′pī, apī′kū |
| older than parent | apa-karī′we<br>apīkū-rūkū′we |
| younger than parent | ka′i-apīpī |
| aunt | mañgō′kō |
| older than parent | mañgū′kū cimbū′we |
| younger than parent | karī′-mañgūkū |
| son | na |
| elder son | awē′-na |
| younger son | ka′i-na |
| daughter | na′ma |
| elder daughter | awē-na′ma |
| younger daughter | kai-na′ma |

In all cases the terms of relationship employed by the women are the same as those used by the men.

From the table of analyses of the terms of relationship it will be seen that in most respects these terms among the Cayapa are fairly simple. They comprise a limited series of fundamental terms on which as bases the rest are built up by combination with qualifying elements bearing certain definite relations to these basal elements. The two important concepts which enter into these qualifying terms are sex and age, of which the latter is the more important.

## MEDICINE PRACTICES. SHAMANISM

753 [778] Among the Cayapa practically all illness is attributed to the presence of malevolent spirits. In large measure the particular spirits which cause illness reside in small, black, water-worn stones, in fragments of ancient pottery, in mammals, snakes, insects, and the like.

By the entering of one of these spirits into the body of an individual, and especially, as is usually the case, if one of the mentioned objects which is the special abode of this spirit enters also, a serious and often fatal illness results. This illness may take the form of any one of the numerous diseases common to the tropics.

There are various ways in which one of these spirits may enter the body. It may, for instance, enter directly into the body itself as the individual is passing the abode of the spirit, or it may enter the soul of the person which, while he sleeps, is traveling about the earth. In the latter case the spirit, on the return of the individual's soul, is taken into the body and the same symptoms and illness result as when it enters directly without the medium of the soul.

755 In almost every case a cure may be effected, provided a competent shaman is called in time. Each shaman has his own method of treatment, but in general these methods are similar and consist of (1) whistling and singing to call certain guardian spirits to the shaman's aid; (2) when these spirits have been summoned, the affected part of the body is sprayed with a decoction of rum and bejuco, and is massaged and rubbed with the hands or is sucked with the lips in order to draw through

the skin the stone or other object which, by traveling 755
through the body, together with the spirit which resides in it, causes the illness.

Shamans or doctors form, to a certain extent at least, 756
a special class by themselves, but, so far as could be ascertained, they have no secret or special organization. They are not, on the other hand, "predestined" or specially selected by natural temperament. Any one may become a shaman if he so wishes by simply training under the guidance and instruction of one or more old shamans of recognized ability. For this training he pays [465]
a stipulated sum, and is instructed every night until he has learned thoroughly the songs and incantations and the various rituals of his instructor, and also has become more or less familiar with the special spirits which his instructor invokes. He does not, however, rely solely on the spirits of his instructor, but sooner or later acquires others of his own. Likewise, he may devise new songs and incantations.

Not only has the shaman to cure by expelling the 789
spirits from the body of a patient, but he has the more important function of expelling spirits from a locality or from a particular house infested with those which cause illness. This expulsion of spirits from a locality or a house is usually accomplished by several persons under the direction of a head shaman. A decoction of rum and bejuco is almost always used by the shaman himself in this exorcism; the other participants are provided with a kind of decoction made by soaking a species of native mint in water. A large number of cigars are also provided, and it is the blowing of the tobacco smoke,

75 along with the spraying of the decoctions from the mouth, that makes the particular locality or house untenable for the spirits. The shaman intersperses his blowing and spraying with incantations and with low whistling. He also carries a special lance-shape wand which he waves constantly with a forward motion.

In one instance in which the spirits were to be expelled from a house, the procedure was as follows: The party commenced at one end of the main floor and went slowly toward the opposite end. As they proceeded, each person thoroughly sprayed the floor in front of him and blew clouds of smoke into the air before him. Also every basket, bench, and pottery vessel, and every nook and corner wherein a spirit might be hiding, was thoroughly sprayed and smoked. The main floor being finished, the loft was treated in a similar manner. Next the party descended to the ground under the house, where everything was thoroughly sprayed, even to the pigs and chickens in their pens and coops. Finally, to be sure that the spirits had been completely expelled, the party proceeded, with its spraying and incantations, into the adjoining clearing, and even for a short distance into the jungle.

755 Such a ceremony is not an especially solemn occasion. In fact the participants laugh and talk throughout, much as if they were engaged in any daily pursuit. This expulsion of spirits is resorted to when several members of a family have been stricken with the same disease. For instance, in case several members have been attacked in succession with fever, one or more shamans are summoned and the spirits which are believed

to be resident in the house or in the surrounding ground are expelled in the manner described. 755

Similarly after death, since the soul of the departed is believed to return to the house and may cause illness or even death of other members of the family, shamans are called in and the particular soul expelled.

Such a soul is not simply driven into the jungle, but ordinarily is driven into the ocean. It goes to one of two places: to the island of Gorgona off the southern coast of Colombia, or to a large mythical sandbar far out at sea. Sometimes souls are driven only down to the sand beaches along the ocean near the mouth of the river, or in some instances to some secluded and lonely spot far in the mountains. In any event the services of one or more shamans must be enlisted within a month or so after the death of a person in order that his returning soul shall not bring illness and perhaps death to any of the surviving members of the household. 755 775

In speaking of souls and spirits it must be borne in mind that as these two terms are here used they are not identical in Cayapa conception. Every animate being has a soul or shade which is a definite part of itself and without which life is impossible. This soul lives on after death. It has the form of the body it occupies, and has the power of leaving the body and wandering about when the body sleeps or is otherwise unconscious, and in this particular resembles a spirit. A true spirit, on the other hand, is a supernatural entity which resides in an object, animate or inanimate, or in a particular spot, but which has nothing to do with the existence of that object. It may take the form of the object it inhabits, especially if the object is animate; but fre- 774 776 774 776

776 quently it has the form of a dwarf or even of a normal human being, especially if its abode is an inanimate object. These spirits may leave their abodes and travel at will, or they may take their abodes wish them. They have great magic powers, both for good and for evil.

754 756 In addition to the benevolent offices of the shaman, he may exercise a malevolent function by calling spirits to his assistance for the purpose of killing or otherwise doing harm to his enemies. The spirits which he uses for this evil purpose may be those which he uses for good in other cases—they may aid him in killing an enemy at one time and in curing a friend at another.

776 778 The abodes of spirits are numberless. They may live within almost any smooth water-worn stone, especially a black or a red one; they are always resident in prehistoric potsherds, especially those of human or animal form; and abide also in almost any object of stone or other hard material of unusual form, particularly if it is smooth. Many mountains and hills contain spirits, both within them and on their slopes and summits. Also nearly every mammal, bird, reptile, and insect is the abode of a spirit entirely distinct from its soul or shade. It is these many spirits residing in both animate and inanimate objects that are the media by which shamans work their magic for both good and evil. A spirit is sometimes called forth from its abode to serve the shaman while thus separated from the object in which it dwells; but it may equally well serve him while in its abode, in which event the object in which the spirit abides accompanies it on its mission.

Furthermore, treatment by magic is almost the only ailment, treatment by magic is almost the only remedy known to the Cayapa, and implicit confidence is reposed in the shaman with his conniving spirits. It may be said that almost without exception no herb remedies are taken internally, and very few are applied externally. 755

For cuts or serious bruises where it is obvious to the Cayapa mind that spirits are not at fault, the wound is generally sealed with brea, the wax of a small bee. This is applied while hot, and appears to have a genuine medicinal value, since it tends to sterilize the affected spot and reduce the probability of infection, so deadly in tropical countries. Similarly a piece of green leaf may be placed over a cut or bruise or over a running sore to protect it from the air, and especially from annoying and dangerous insects. This treatment is used especially for the ulcers which result from the bite of a small mosquito found in large numbers in this part of the tropics. Almost any kind of a leaf serves this purpose, and the treatment has of itself no aseptic virtue. 752

For anything more serious than a cut, bruise, or ulcer, no treatment is used other than bathing the wound occasionally and perhaps bandaging it, since such cases are considered too serious to yield to treatment. This is especially true of an ailment caused by something of foreign origin, as a gunshot wound, which, being due to an instrument of which the Cayapa have no aboriginal knowledge, cannot be cured by a shaman. If, on the other hand, a wound of this kind results in complications, such as increased temperature, a shaman is summoned to treat it for the reason that the affection is obviously due to the presence of malevolent spirits; but the Indians 752 755

752 maintain that a shaman never attempts to cure the
755 wound itself. A case of this kind observed in 1909 was that of a young man who had been accidentally shot at close range. There were seven buckshot holes through the calf of the leg, and each formed an ugly gangrenous wound. When first seen seven days had elapsed since he had received the wounds, but no treatment, magic or otherwise, had been given other than the bathing and bandaging above mentioned.

756 A shaman's paraphernalia consists almost invariably
778 of three classes of objects. First, one or more small lance-shape wands of black wood, each possessing special magic power from the spirit or spirits residing therein; second, a bottle of a decoction of rum and bejuco; third, a number of smooth black stones, potsherds, and similar objects of unusual forms. Especially valued are the ancient stone axes, either whole or fragmentary, which are found now and then about old village-sites and mounds or along the banks of streams. These objects, as before stated, are all supposed to be inhabited by spirits. One may be the abode of only a single spirit, while another may contain as many as ten or a dozen. One stone ax, for example, in possession of a shaman near Punta Venado, was said to contain five spirits. When an attempt was made to purchase this ax from him, he was greatly in doubt whether it would be wise and proper for him to part with it. To settle the matter he sprayed the stone with the decoction of bejuco and rum, and sang and whistled to it for a considerable time, meanwhile gazing at it intently. At last he pointed out the exact positions

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SD 6 Cayapa SD6

of the five spirits which the stone harbored, and explained how each was angry at him because he had even thought of disposing of the stone. He of course refused to sell it, stating that it would be of no use to the purchaser for the reason that if the spirits were not willing that it be sold they would return, together with the stone, on the following night, to the basket in which he kept it, and that the purchaser would lose the price paid for it, since it would be impossible for him ever to keep the stone, no matter in how strong a receptacle it might be put, because the spirits were able to take it at will wherever they liked. 756 778

While these stones and other objects used by shamans in their practices are so highly prized and so carefully handled by them, little care is taken to guard such objects from contact with other persons. Ordinarily they are kept in an open basket upon the floor and within the reach of uninitiated adults as well as of children. There seems to be no fear that the mere handling of these objects will cause any ill effect on the uninitiated—it is only when such a person attempts to use one of them for the purpose of doctoring that there is danger. 756

As above indicated, objects containing spirits may be bartered among the shamans whenever the spirits themselves are willing, and they are sometimes sold without consulting the spirits; but if it is a particularly valuable object and the abode of several spirits, these are always consulted before it is disposed of. 756 778 437

Although there are several shamans in the three divisions of the Cayapa, shamanism is comparatively little practised, and the position of a shaman in the tribe 756

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SD6 Cayapa SD6

756 is not a very important one. The Cholo of the southern part of Colombia, on the other hand, are noted, at least among the Cayapa, for their knowledge of magic. In fact there are no fewer than five or six Cholo shamans who live constantly on the Rio Cayapas, and it is to these that the Cayapa often apply when in need of shamanistic services. The negroes of the region also have their shamans, who are often summoned by the Cayapa, particularly for the purpose of treating the sick. For the expulsion of spirits from a locality or from a house, however, the Cayapa rely almost entirely on either their own shamans or those of the Cholo.

## RELIGION

### THE UNIVERSE

772 There is a gigantic being, called Tyapatci tena'tü, who supports the lower world upon the palm of his hand. Upon the lower world, called ta'fica, which means literally "within," is mounted a great pillar of gold and silver that holds up the middle world upon which we live. Upon this middle world there rests another pillar of gold and silver which supports the upper world, called ka'ica, above which there is nothing. The lower world is inhabited by the pehärü pu'tyü; the middle world is inhabited by human beings and the various spirits, and the upper world is the abode of a still different people, ideas concerning which are not very clear.

In the lower world conditions are in every way the reverse of those in this world. There, for instance, the sun and the moon travel from west to east, they being the same orbs, however, which illumine our world. 772

The sun and the moon, pa″ta and pō pa″ta, are two men whose eyes are their source of light. Formerly they both gave the same amount of illumination, but owing to this fact night was, in ancient times, as bright as day, and the inhabitants of the earth were able to hunt at all hours. They thus menaced the existence of all animal life, a fact which, when the Creator saw it, caused him to alter conditions by covering up one of moon's eyes, so that now the moon gives only half as much light as the sun. 772 821

Near the eastern margin of our world there is a large hole through which the sun comes up from the underworld in the morning. He then walks up a trail in the sky, shedding as he goes the light of day upon the earth. By some this is referred to as "walking up the big mountain of the sky." As elsewhere noted, it is supposed that at this eastern margin of the world there lives a race of pigmies called pa'ʟa'mbele, whose diminutive size is due to the great heat of the sun, which is so near them as it emerges from the lower world.

At the zenith there is a chair in which the sun takes a brief rest at noon. Here he eats a small lunch consisting of cornmeal mush and boiled grouse-eggs, after which he continues along the trail down the western slope of the sky until evening, when he reaches another opening near the western margin of the earth through which he disappears into the underworld to furnish it with light. His only companion during these endless journeys is a white dog. He himself is dressed in pure white, his

772 821 clothing being made after the fashion of the shirt and trunks commonly worn by Cayapa men.

The moon travels the same trail and in exactly the same manner as does the sun, stopping at the zenith to rest and eat. He is in every way the equal of the sun, except that he is unable to give so much light and is entirely alone, not even having a dog as a companion. His clothing also is pure white and is the same as that of the sun. Being in ordinary human form, neither the sun nor the moon is able to fly, but they keep up their journeys along this endless trail year in and year out with no halt save those short stops at the zeniths of our world and the underworld.

821 No accounts of eclipses of either the sun or the moon could be obtained, and no theories concerning the phases of the moon were advanced. In fact, other than the foregoing meager mythical account of the sun and the moon, no information whatsoever was obtainable from the Cayapa respecting either of these celestial bodies. Furthermore, no particular information was obtainable in regard to any of the individual stars or any of the constellations. The almost total absence of star-lore and of acquaintance with the heavenly bodies may possibly be accounted for by the fact, already noted in referring to the climate of the region, that the sky is almost continuously overcast, the clouds hiding from view almost constantly all the heavenly bodies. To be sure the Cayapa formerly lived in the interior where these conditions do not prevail to such an extent, but they have lived in their present environment for several generations and have had ample time to lose much of any system of star-lore that they may have possessed originally.

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

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SETTLEMENTS OF WHITES AND NEGROES ALONG THE RIO CAYAPAS

[p. 354 (a)]

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p. 354(B)

HACIENDA OF A NEGRO IN A GROVE OF COCONUT PALMS

The three worlds of the Cayapa are each flat, approximately square, and of about equal size. A short distance beyond the openings through which the sun and moon emerge and depart from it, are the eastern and western edges of our middle world. There are also a northern and a southern edge to the world. Beyond these edges there is nothing. 772

The upper world, ka'ica, is similar to our middle world, but it lacks rivers, the sea, and indeed any body of water. Furthermore, it never rains there. It is illuminated constantly by another sun, which is stationary. Ideas concerning the inhabitants of the upper world are not very clear. It is known that they have houses, but these are of a different form from the Cayapa dwellings, being described as somewhat like the houses built by the white people in the settlements at the mouth of the Rio Cayapas, which means that they are not set high upon piles and that they have sides (pl. CXXX-CXXXI). [775] By some it is claimed that the souls of departed human beings reside in this upper world, but most say that they reside at certain out-of-the-way places on the earth. It is said that this upper world is inhabited by spirits, but their exact nature is not clearly understood.

## CREATION

The Cayapa appear to have no native account of the creation of the universe, at least all attempts to obtain such were futile, and there appears to be only a remnant of an account of the creation of human beings, and this is more or less mixed with introduced religious con- [773 177

773 ceptions, if indeed it is not entirely a distortion of the
[177] biblical account of the genesis. According to this,
God (Dios apa) fashioned out of clay five pairs of in-
dividuals in the form of human beings, at a point far
in the mountains east of Quito; he then spat in their
mouths and they sprang up in the full vigor of life.
They went immediately to the region of Ibarra and
became the first Cayapa. No details are given of their
further existence up to the coming of the Spaniards. It
173 is said that at that time they had so far increased as to
fill the country completely. This account further states
that, owing to their fear of the Spaniards, and especially
of horses, they migrated to Pueblo Viejo in the lower
mountains between Ibarra and the coast at a time shortly
after the arrival of the first Spaniards. According to
other accounts it would appear that this migration was
probably prior to the conquest and may have been due
to the encroachment of other tribes. It seems not
improbable that the active conquest by the Quichua
of Peru, which extended throughout the interior moun-
tain region of Ecuador at a time immediately prior to
the Spanish conquest, may have been the cause of this
773 migration. Other than this meager account, the abori-
ginality of which is doubtful, it was impossible to obtain
a trace of a creation myth accounting for the presence
of human beings on the earth.

As for the universe itself, it seems to be accepted by the Cayapa as having always existed and as having required no act of special creation.

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

## THE SOUL

The soul, called kū'mī, inhabits every human body as well as the bodies of certain other animate beings. In general it has the form of the body that it inhabits, and has the power of leaving the body during sleep and of traveling about at will. In their travels the souls visit many places, such as cemeteries, houses of friends, etc., and are subject to considerable danger while thus wandering about. A shaman with malicious intent may by his magic summon one of these wandering souls and, by appearing friendly, may gain its confidence sufficiently to induce it to drink chicha, thus partially intoxicating it and enabling him to insert within it a pebble, a snake, an insect, or some other object which will work ill. On returning to its body, the soul takes with it this malevolent object, which also enters the body. As a result, illness follows almost immediately and the person dies within a short time, usually at or just before sunset, unless properly and promptly doctored by a shaman. Such illness is said to resemble an attack due to a natural cause, which is to say that it resembles an attack caused by the entrance of similar objects into the body by means other than through the agency of the soul; for it must be remembered that all illness other than that resulting from wounds, bruises, or other visible external means, is attributed to the presence of one or more of these magic objects in the body. It is said that fevers, for instance, which result from the presence in the body of these malevolent objects brought to it by means of the soul, cannot be distinguished in

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753 their symptoms from fevers resulting from drinking water in a new region. [164] This alludes to the fact that in this region it almost invariably happens, even with people in perfect health, that if they travel from the coast into the interior mountains, or vice versa, they become ill for a short time with a fever of greater or lesser gravity. This is attributed directly to the change of drinking water, though in the Cayapa mind there is here also a direct connection with spirits.

754 775 A still greater danger to the soul as it travels about during sleep arises when a shaman sets a trap or a deadfall at any point he thinks a soul is likely to pass. If the soul gets into this trap or deadfall, it is killed, so to speak, and its owner never awakens. The soul itself, being immortal, later escapes from the trap or deadfall and passes on with its future existence, but once the life has left the body which it formerly inhabited, the soul is never able to return to it.

775 After death, souls travel about as they do in sleep, frequenting for a time special burial places and the homes which their bodies formerly inhabited. They would, if unmolested, continue indefinitely to go about their former haunts, but, owing to the danger to the living from their presence, means are taken to expel them. The expulsion of these souls, as also of malevolent spirits, by one or more shamans has been described in detail in speaking of medicine practices.

774 By many it is claimed that certain mammals, birds, reptiles, and other animate objects do not possess souls, but by others it is claimed that every animate object has a soul. Inanimate objects, such as waterworn

Inanimate objetts, such as waterworn
pebbles, fragments of ancient pottery, ancient stone 774
implements, and practically all hard objects of unusual 778
form, are the abodes of spirits, but have not souls like those of animate objects. The souls of other animate objects may travel about during sleep and unconsciousness, just as do the souls of human beings. The spirits resident in inanimate objects, which of course do not sleep, travel only at night. As a matter of fact the souls of animate objects also travel almost exclusively at night, since, with but few exceptions, these animals sleep at that time. The souls of animate objects and the spirits resident in inanimate objects seem to be endowed with about the same attributes, and they mingle on friendly terms, assembling in various places to dance together, visiting burial places together, and in general making common cause in their wanderings and associations.

What seems to be an intrusive idea from Catholic 775
sources is that human souls ascend at death to the upper
world, but ideas concerning this abode and the ascension 177
of souls are largely indefinite. However, it is maintained by some who hold rather vaguely to these concepts that God keeps there a long ladder which, when the person is about to die, he drops down in order that the soul
may ascend. But the majority of the Cayapa, and [784]
even those who claim to believe in this ascent to the upper world, avoid burial places at night and have the souls of departed friends and relatives expelled by shamans from their houses and driven out to the ocean in the old orthodox Cayapa manner.

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SD 6 Çayapa SD6

## SPIRITS

776 In addition to human beings and other animate creatures, the world is peopled by a myriad of spirits of many kinds. As has been already indicated, these spirits live in or upon mountains, at certain places in streams, in stones, in fragments of ancient pottery, and in every sort of object of unusual form. Many are benevolent spirits, while others are always malevolent, and still others may be both malevolent or benevolent as occasion demands. Some classes of spirits are entirely male, others entirely female, while in still others are found men, women, and children, and full family relations. Some are giants, some dwarfs, and many are of ordinary human size. Most are in human form, though the bodies of some are deformed or are lacking some particular parts or organs. Many of these spirits dress as do the Cayapa, though others have special forms of dress, and still others no dress at all. Spirits are of various colors also, though the greater number are of the same color as well as of the same bodily form as the Cayapa. In large measure they move about only at night.

## THUNDER

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821 One of the most important of the spirits recognized by the Cayapa is Thunder, kū'īdya. According to some informants the Thunders are two, a male and a female; they somewhat exceed in size the average spirits, and have light-blue bodies covered with coarse hair somewhat like hog-bristles. The thunder spirits wear no clothing

and do not paint their bodies; they have large blue 776 wings with which they fly from place to place, and the flapping of which causes the detonation we call thunder. 821 They have no special abode, but frequent certain places more than others: especially do they frequent a particular high hill far up the Rio Cayapas.

Other informants differ in some particulars in their description of Thunder. By them it is said that he has no wings and does not fly, but that he and his wife sit constantly on top of a large tree on a high hill far away in the mountains. They are giants, with very massive backs, and are very strong. They have very [755] long finger-nails, which are hard like rocks; these they shed from time to time and when found they are much prized by shamans for curing disease. Instead of having bluish bodies covered with bristles, the Thunders wear the ordinary attire of the Cayapa, but of a blue color. In addition they both wear blue caps, and both have long hair on their arms. When in a bad temper, Thunder talks loudly and growls, thus making the thundering noise. His bad disposition is especially manifest in the rainy season, while at other periods he is mild-tempered, growling only occasionally. Thunder's wife never has anything to say. It is said that up to about a generation ago the Thunders lived toward the lower course of the Rio Cayapas, but that in recent years they moved into a very remote part of the mountains and that thunder is consequently less frequently heard now in the Cayapa country.

### LIGHTNING

776 821 Lightning, kū'īdya pīdya, which almost all peoples seem to recognize in one way or another as directly connected with thunder, is attributed by the Cayapa to the sword-like weapon carried by the Thunder spirit. [177] As they describe this weapon at the present time, it is obvious that modern ideas have intruded, although it seems probable that the concept of lightning coming from an implement carried by the Thunder being is aboriginal. The sword is said to be of steel and to be carried in a scabbard; it is highly polished, so that when it is unsheathed the glint of the sunlight upon it is like the reflection from a mirror. It is maintained by some that Thunder strikes and kills people with this sword, or at any rate with the glint of light from it.

It is said that in the dry season Thunder is quite contented and lives at peace with the world. In the rainy season, however, he becomes restless and very much discontented with human beings and with conditions generally, and it is then that, according to the first informant mentioned, he flies from place to place through the clouds, flapping his wings and making an uproarious noise, swinging his sword and causing the flashes of lightning. In due time, however, his wrath subsides and he becomes weary, and during the remainder of the year he grows restless only occasionally, with the result that thunderstorms rarely occur and lightning is seldom seen.

### CAVE SPIRITS

Another important class of spirits are the bū''tcūlya, or tūnda, called also by the Spanish name malava. These spirits are very numerous, and live, each family by itself, in what may be termed hollow mountains, that is to say, mountains containing enormous caves (a tū'hūrū), with numerous chambers, each illuminated by means of a sande-sap torch. Within such a mountain the house arrangement is much like that of a Cayapa dwelling, except that it is not elevated upon house-posts and of course has no thatch. It also has no storage loft, and its floor is simply the dirt or stone floor of the cavern. Access to it is by means of a tunnel entrance in the side of the mountain, never through a shaft on the summit. The entrance is covered by a very large mat and is not visible to human beings. Here the parent bū''tcūlya lives with his family in exactly the same manner as would a Cayapa. He also has domestic animals and birds as have the Cayapa. His "dogs" are the jaguar, ocelot, and puma. He also keeps as pets the wild-hog, the peccary, the two large species of rodent called in Spanish guatin and guanta respectively, and various smaller mammals. His "chickens" are the two species of wild turkey, the grouse, and the doves of the various species common to the region. All these mammals and birds living in the cave of bū''tcūlya are the same as those which run wild in the mountains, except that they grow to immense size and are always very fat. Also all the wild birds and mammals of the jungle are the pets of the bū''tcūlya and are under his special protection.

He always has stored large quantities of the eggs of these birds, especially those of the large species of grouse known locally as perdiz. The house furnishings are similar to those of the Cayapa, except that the coiled equis, a very poisonous snake, is ordinarily used for a bench or seat, while the coiled boa is used as a receptacle for serving food.

In personal appearance the bû''tcûlya is similar to the Cayapa, except in color. By some he is said to be whiter and of a more reddish cast than the Cayapa, but by most his face is said to be bright yellow, for the reason that he paints it all over with yellow achote. It is claimed that the rest of the body is not painted. The women bû''tcûlya are said to be very beautiful and to have long flowing hair. By some it is claimed that the bû''tcûlya have bodies of normal form, but by most informants they are said to have no buttocks or anus, and hence are unable to defecate. For this reason they never eat, but gain sustenance from the water they drink, and especially from the steam and aroma arising from boiling meat and other foods. Although unable to defecate, they can urinate and hence are able to drink water and inhale steam. Their genital organs are perfect, but they are incapable of sexual intercourse except in bright moonlight.

In ancient times the bû''tcûlya were much feared by the Cayapa because the sight of one of them would bring illness and ultimate death, and also because they would steal children and even adults. In more recent times, however, it is claimed that they do not steal people, but confine their depredation to dogs, pigs, and chickens, and the vegetal foods raised by the Cayapa.

They go about inhabited places always at night, and although ordinarily they are invisible to the human eye, their presence is known by their blubbering speech, although they can speak intelligibly if they so desire.

That, to the Cayapa mind, the bū"tcūlya still exist and that they are much feared is shown by the following incident. While the guest of one of the Cayapa officials it was the author's custom sometimes to sit for [123] hours in the evening conversing with him on various phases of Cayapa life. On one of these occasions, on a pitch-dark night, we were talking merely of the ordinary pursuits of the people. A lighted torch had been placed between us, which precluded the probability of the informant being able to see into the darkness outside the house. Suddenly, in the midst of our conversation, he sprang to his feet, ran over and untied the dog, and sent him down the ladder, while he himself ran to the railing at the side of the house, meanwhile urging the dog on in pursuit of something out in the darkness. He later explained that he had heard the blubbering speech of a bū"tcūlya near the house; he had seen nothing of the spirit and knew of its presence only by the sounds it made, but had hastened to drive it away to keep it from stealing his pigs and chickens which were confined under the house.

These spirits are believed to travel during the day as well as at night, and in case a house is left without occupants they frequently visit it and either carry away the food stored in it or cook it on the spot for the purpose of inhaling the steam and aroma which arise therefrom.

Although it is maintained that the bū"tcūlya do not

776 carry people away bodily at the present time, they nevertheless entice them to their caves, but this is said to be done out of a spirit of sociability and not with the desire of doing them bodily violence, though there is considerable danger attached to a visit to such a cave. These spirits, though ordinarily invisible, have the power to make themselves visible to human beings at will and when a person is off in the jungle, or in any lonely place, he is likely to be visited by a bū''tcūlya and invited to return with the spirit to his cave. If he goes and enters only the outer chamber of the cave, he can return, but if he is enticed into the inner chambers, escape is impossible, for these are guarded by vicious jaguars and pumas. On entering an outer chamber a guest usually is invited to sit upon a bench consisting of a coiled equis, and is offered food upon plates made of coiled boas. Stories are told of people who, on falling asleep or becoming intoxicated in some lonely spot, have been enticed into one of these caves by a bū''tcūlya and have seen and experienced various things in the outer chamber and yet have escaped [753] and returned home. After such an experience a person is likely to become ill, and if not properly doctored by a shaman will ultimately urinate blood and then die. Merely to see and to talk with a bū''tcūlya, however, is not of itself fatal as is the case with some other classes of spirits.

An experience is related by a Cayapa who once had occasion to make a canoe at a place back in the hills and far from his house, so that it was impossible for him to return home every day. He therefore, as is customary, built near his work a small "rancho," or temporary house, for himself. Upon returning to the hut late one afternoon, he found in the fireplace a fresh fire, which he could not account for; but he was more greatly surprised the next evening to find not only a fresh fire but a potful of cooked food. He therefore determined to spy upon the hut, and accordingly, on the third day, returned early in the afternoon, when he found there a very beautiful yellow-complexioned girl with a large pot of cooked food and with bala prepared for the evening meal. She had been cooking and preparing this food in order that she might inhale the steam and aroma from it. He entered the house and spoke to the girl, but received no answer. He then said to her, "Come, give your husband some food." She gave him the food, but still made no reply to his remarks. Later she left the "rancho" abruptly, saying that she did not wish to marry a man who ate all kinds of food while she was unable to eat anything.

Another Cayapa, out hunting, shot a turkey, and while reloading his gun was suddenly felled by a heavy blow from behind. Some one cried, "Why do you kill my pets?" He looked all about, but could see no one. This also was a bũ"tcũlya, which had been angered by the shooting of the turkey, for all wild birds and mammals are the pets of these spirits.

Another old man, who was adzing a canoe near the bank of the river at a point a short distance above the house of the chief at La Herradura, became somewhat intoxicated and feel asleep. A bũ"tcũlya came and invited the old man to his home. Accepting the invitation, he soon found himself in the large outer chamber of a cave. Here the bũ"tcũlya showed him various mammals

776 and birds, all very large and fat, which he kept as pets. He then invited the old man to sit upon his bench, which was a coiled equis, but the old man declined. He then offered him a cup of champo, a drink made of corn, the cup being a coiled boa. Again the old man declined. The spirit then invited him to go enter the inner chambers of the cave, but on approaching these the old man found them guarded by jaguars tied at each side of the entrance, which so frightened him that he did not dare to proceed. He had not gone more than about [illegible]ty-five feet into the cave, so was enabled later to escape. He sat in the outer chamber for some time, and talked with the bü'"tcülya, who explained his mode of life, how he obtained his food, and various facts concerning himself and this class of spirits, all of which the old man related on returning home. This old man returned the same day; but in the case of another Cayapa who was enticed into a cave of the bü'"tcülya, he was detained for three days, but the spirit was not able to induce him to enter one of the inner chambers. During his entire stay the spirit from time to time offered him foods of various kinds upon plates made of coiled serpents, all of which he refused. At the end of the third day he was permitted to return home, although he was much more dead than alive from the ordeal through which he had passed. The man almost immediately became ill, his body was covered with sores, and in the course of a week he urinated blood [753] and died. After such a protracted visit to the cave of one of these spirits, death is almost certain.

That the mammals and birds kept by the bü'"tcülya spirits in their caves are so large is said to be because the spirits themselves never eat any of the material part 776 of the great quantities of food which they appropriate and cook; consequently this food is fed to their pets. The food is thrown to them upon the floor, as we might feed an animal, but all food offered to human beings who are guests in the cave is served upon coiled serpents.

While the bä'tcūlya live primarily on the earth, they [82] are able to ascend into the upper world by means of the rainbow (bä'tcūlya ciñgütiñatū) to visit Thunder. The object of this visit is purely a friendly one, since the bä'tcūlya are not servants of Thunder and neither do favors for nor receive favors from him.

### INDIOS BRAVOS

A class of beings which seems to be partly mythical and 776 partly to have a basis in fact are the Indios Bravos, or be ñya'la. 173 As was mentioned in speaking of the history of the Cayapa, it is claimed by them that their occupancy of the country adjacent to the Rio Cayapas dates only from comparatively recent historic times, and that formerly there lived upon the river the Indios Bravos, a people who subsisted, partly at least, on raw human flesh. In other respects these people were much like the Cayapa themselves. They lived in isolated family groups and had no villages; they were a little taller than the Cayapa, but of the same general appearance and color; their clothing, however, consisted of a short skirt of black cloth, which was the dress of both men and women; they used no paint on their faces or bodies; their most striking physical feature was their very large eye

3: Barrett E-5 (1908-1909) 1925
SD6 Cayapa SD6

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173 teeth, similar to the fangs of the jaguar. After the Indios Bravos had preyed on the Cayapa for many years, the latter arose against them and descended upon their territory with a strong force armed with magic weapons, almost annihilating the cannibals and taking possession of their country. A detailed account of this trouble between the Cayapa and the Indios Bravos is given on pages 32-36.

It is said that a few Indios Bravos still exist far back in the mountains near the headwaters of the Rio Guayabumba, where, contrary to their ancient custom while on the Rio Cayapas, they have a village. They are never visited by any surrounding peoples, and are much feared by all. In recent years the only definite report of them which has reached the Cayapa is that, while a party of negro rubber gatherers was on the headwaters of the Guayabamba, they came upon three Indio Bravo boys whom they captured after a desperate struggle. Being on their way to Quito, the negroes endeavored to take the boys along. En route two of them died, but the third reached the city and was placed in the care of some priests. One of the Fathers later had a finger bitten off by the boy, thus showing the innate viciousness of the Indio Bravo tribe.

It is said that the Cayapa fought the Indios Bravos with a short palm-wood spear. These weapons are still found occasionally, partly embedded in the sand of the river where they have drifted from ancient times. These implements are said to be so dangerous that if a person attempts to pick one up or touches it in any way, illness is sure to follow. It is probable that this short

776 173 palm-wood spear is in reality the magic wand which was used by the Cayapa against the Indios Bravos when they were driven from the Rio Cayapas, as before mentioned. The Cayapa were able to do this by virtue of their superior magic and the superior magic of their wands, and not by means of ordinary conflict, hence it is the magic of these wands or spears which still clings to them that renders them so dangerous even at the present time.

### THE GIANT ASLAŪ'HMŪ

776 A class of male giants said to have been very numerous in former times in the foot-hills bordering the Rio Cayapas is the aslaū'hmū. It is said that these giants became frightened at the first firearms possessed by the Cayapa and that they gradually disappeared into the mountains farther back from the river. Here they still reside, and even yet capture people who venture too far into the jungle. These giants are from eight to twelve feet in height, have skin of the same color as the Cayapa, and have very long fingers without nails. Their noses are very large also, being about three inches in length; their eyes are very large, and the mouth is irregular in shape; they have no teeth, and are unable to talk; the upper part of the abdomen appears normal, but the back from the ribs down is lacking, and within the abdominal cavity the liver is the only organ present. They wear a kind of skirt of bluish cloth, somewhat similar in texture to that woven by the Cayapa, and a bluish shirt reaching to the umbilicus and with sleeves which come to a point just above the elbows; they also wear a tall blue cap

which has no vizor. The aslaū'hmū travel in bands of five or six, or even more, and often attack hunters or others who are alone in the jungle. They carry long whips slung over the shoulders, the lashes of which are provided with thorns, and with these they strike and kill people. As the whip is swung over the shoulder to strike a blow it makes a loud noise like *thrūm-m-m-m-m!* They eat no food whatever, and make no use of the bodies of their victims—the body is simply left where it has fallen and may be easily recognized by the black stripes from the whips with which it has been struck. These spirits are themselves vulnerable, having been killed by hunters with lances, and it is from this fact that the Cayapa are able to give so exact a description of them. While out in lonely places hunters and others must use great care to protect themselves from the windward side, since the aslaū'hmū travel rapidly with the wind and usually attack from that direction. They travel, on the contrary, very slowly against the wind, even though it be no more than a breeze.

### ŪRA''TŪ

In a large village in the mountains to the east of Quito reside the ūra''tū, who have no other abode, but are able to travel very swiftly over any part of the world. Here they live in every respect like the Quichua Indians of the mountain region. They have low, thatched houses, without sides and with earthen floors. Every night the floor of one of these houses is thoroughly cleaned and a dance is held, in which most of the ūra''tū participate

Some dance on their feet, some on their hands, and some on two long fleshy projections like horns or ears which grow on top of the head, but which are quite different from the ears of men. These spirits are about the size of the Cayapa, and live in family groups in their village as do human beings. Their skin is very black, and their hair kinky and bushy. The mothers carry their babies upside down on their backs. The women wear simply a black skirt, while the dress of the men consists of short trousers reaching almost to the knees, and a reddish short-sleeved shirt. In the mountain region nearer to the home of the ūra″tū they are a great menace to the people, since they steal human beings bodily, and merely to see one of them assures illness of some kind and probably death in a short time. 776 [753]

### KŪ′ME

Another dangerous class of spirits is the kū′me, who live in the mountains and in deep pools in the river. These are described as being of about the size and general appearance of human beings, but with very black skin. The kū′me always go about with their heads thrown far back, so that they face the sky and are unable to look forward. They travel late in the afternoon and at night, and are in the habit of pursuing people who are out at such times. If a person is caught by one of the spirits, and especially if he is hugged by the spirit or if the spirit's breath touches his body, illness is sure to follow and death is certain unless the patient is properly treated by a shaman. These spirits are entirely invisible 753 776

753 to ordinary human beings, and when they attack a person
776 they remain with him throughout his illness and until
death, when they snatch the soul as it is departing from
the body and carry it away. They may be seen and
driven away, however, by shamans who have drunk of
the decoction of rum and bejuco, and who are able to
chant the proper incantations.

### PĪ″TCŪLYA

776 Especially dangerous to canoemen are the pī″tcūlya, a
class of spirits which live in caves in the bed-rock at the
bottom of deep pools and at various places along the
banks of rivers. In these caves the families of pī″tcūlya
live in the same relations as do those of the Cayapa.
Their women are especially beautiful and all have very
776 long flowing hair. In the evening and at night, especially
if the moon is bright, these spirits rise to the surface of
753 the water and sport about, and it is at such times that
the danger to canoemen in passing is greatest, since to
see one of these spirits, and especially to approach so
near that the spirit may blow its breath upon one, assures
a severe attack of fever and is likely to cause death,
although the patient may be cured by a shaman. The
776 pī″tcūlya women wear a black skirt, and the men employ
the same kind of clout and shirt as those of Cayapa men.
All wear very large necklaces of various objects made by
the prehistoric inhabitants of the region. Both sexes
paint yellow all exposed parts of the body. Like certain
other spirits, they are unable to eat solid food, but subsist on the steam and aroma rising from cooking fish.

Almost all deep pools in the river are the abodes of pī’’tcūlya, although some contain more than others. Opposite Punta Venado is a large pool which contains many of these spirits. To reduce the danger to the people, the chief of the Punta Venado division of the Cayapa summons from time to time one or more shamans for the purpose of driving out the spirits at this particular place, because, being so near the village, they are believed to endanger the lives of those who assemble to attend the fiestas.

### PAIŪ Ū'HMŪ

The paiū ū'hmū are a mythical people who formerly inhabited the region of the Rio Cayapas, but who are now rarely, if ever, seen in this section. By some they are described as creatures of about normal size and with heads similar to those of human beings, except that in place of the mouth they are provided with a sharp beak with which they kill people, and afterward, by inserting this beak into the skull, suck all the blood from their bodies. They never eat human flesh, but subsist entirely on human blood obtained in this way. By others they are described as giants, nine or ten feet in height, who, in place of a head, are provided with a long, bird-like beak with which they kill their victims and suck their blood. All informants declare that the paiū ū'hmū are black in color, that they wear no clothing, and make practically no sound except a low call. They particularly attack hunters who wander far out into the mountains, and for a lone hunter to encounter one is almost certainly fatal, though two together may overcome and kill such a being.

### PEHŪRŪ PŪ′TYŪ

776 Another class of spirits, which are not particularly dreaded since they are never seen by man, are the pehūrū pū′tyū, a race of beings which in every respect are like the Cayapa except for the absence of buttocks and anus. There is a difference of opinion as to the abode of the pehūrū pū′tyū. Some claim that they are the creatures who inhabit the lower world, while others maintain that they live within the earth itself and that formerly they inhabited the region now occupied by the Cayapa themselves. According to these informants, at a time before the creation of the Cayapa there came a tremendous earthquake which overturned the earth and buried these pehūrū pū′tyū within it, where they still live in the same manner as when above ground. Then the Cayapa were created to live upon the earth; but at some future time another great earth convulsion will overturn the world again, bringing the pehūrū pū′tyū to the surface and burying the Cayapa and all other human beings.

The pehūrū pū′tyū, like certain other classes of spirits, subsist exclusively on the steam and aroma arising from caldrons of cooking food, this being sea-fish, which are very abundant where they reside. They have no homes, but constantly travel about. Like two other classes of supernatural beings, the pehūrū pū′tyū are incapable of sexual intercourse except when the moon shines brightly.

### PA′ʟA′MBELE

A race of unimportant pigmies, called pa′ʟa′mbele, inhabits the eastern margin of the world, in the vicinity of the hole through which the sun emerges from the lower world in the morning to make its daily tour of the heavens. These beings are said to be extremely small, owing to the proximity of their homes to the path of the sun, which is so hot as to stunt their growth. They never travel, and do neither good nor harm to man. There are, however, no corresponding peoples living about the orifice through which the sun disappears in the west.

### PEJE BRAVO

In addition to the various spirits which inhabit deep pools along the river, there are what are known as peje bravo, large fish, armed with strong teeth, which sometimes attack canoes and canoemen, but which are also much feared because of their magic. Almost every pool of any considerable size along the river is reputed to contain one or more of these dangerous fish. To be sure they molest travelers only at comparatively rare intervals, yet they are much feared by canoemen. Like the spirits they may be driven from a particular locality, or they may be imprisoned in a cave or a crevice in the bed-rock of the stream and rendered harmless to passers-by. For instance, at a point known as La Herradura, on the Rio Onzole, there is a large pool at the lower mouth of a short, precipitous stream which cuts across a narrow neck of land for a distance of eight hundred or a thousand feet and connects one point of the main stream with another at least a hundred feet lower in altitude. The narrow neck of land connects a large hill with the mainland, and it is around the base of this hill that the main stream

776 of the river takes its course, thus traversing a distance of five miles or more in reaching the same level that the smaller and more rapid stream reaches in a comparatively few feet. It is this long bow in the main stream which gives this point on the river the name of La Herradura, "the horseshoe." During periods when the water of the river is at the ordinary level, the shorter stream is small, but in times of flood it is a raging torrent. By the time the water has run its short course and reënters the main stream, it attains a high velocity and shoots a powerful, billowy current far out into the main stream which here widens into a deep basin. At the sides of this current are numerous eddies, and often great logs and even whole trees are held by them and whirled about for hours, in which process large limbs are twisted from trunks and everything fragile is splintered into bits. It is impossible for a canoe to pass through this pool at such a time; it is, in fact, none too safe to skirt the extreme edge of the pool opposite the torrent which enters it, on account of swirling logs. It is small wonder, then, that the Cayapa should conceive some great supernatural force to be hidden in this pool. It is said that up to within the last few years there lived in this pool a school of immense bright-red fish, which were a constant menace to travelers. Even to see one of these fish assured the illness of a person, and death was almost sure to follow. Still more dangerous was it to touch one of them. These monsters had a trick of floating as if dead upon the surface of the pool, especially when the water was at normal level and the surface reasonably calm. Curiosity of passers-by sometimes tempted them to paddle near

enough to take a good look at the red object, or even 753
to touch it, either of which proved fatal. At last, how- 776
ever, some powerful shamans visited the pool and by 776
their incantations were able to impound the fish in a cave 756
in the bed-rock at its bottom. They then sealed the mouth of the cave, it is said by some, with iron, so that for some years the pool has been passed without harm. However, there is still fear that the fish may some day break their bonds and again come to the surface and menace the lives of canoemen.

## PĪ PĪ'NĪ

While there are many large pools along the Rio 776
Cayapas which are given the general Spanish name charco, there is one so large and important that it is always known as El Charco. This is situated at a point about three miles down-stream from the confluence with the Rio Onzole. It was the former habitation of a kind of dangerous fish, or serpent, called pī pī'nī, literally "water serpent," concerning which the following story is told:

In former times El Charco was much larger than at present, covering the plain now adjacent to it and reaching from hill to hill on each side. Here lived an especially large pī pī'nī, which devoured everything coming down the river. It had a mouth twenty fathoms wide, and everything, including all driftwood and even entire trees that floated down-stream, was consumed by the monster. Within this great serpent there was an immense dry area in which accumulated all the logs and trees that

**3: Barrett E-5 (1908-1909)1925**
**SD 6 Cayapa SD6**

776 he swallowed. Naturally, all human beings who went down the river upon rafts (for in those days canoes were not used) were swallowed by the pī pi'nī, so that the population of the region decreased rapidly. In fact, this serpent became such a menace to travelers that at last no one attempted to pass El Charco by water. From a point above El Charco a trail crossed the hills and returned to the river at a point called Nañjara, a short distance below El Charco. When travelers wished to pass down the river, they moored their rafts at the upper end of the trail and passed El Charco by land, taking another raft at Nañjara and continuing their journey to the sea. The same change was made on the return trip. Finally, four powerful shamans determined to rid El Charco of its danger, and after devising a method of keeping fire for a long time, they started down the river upon their raft. On approaching El Charco, they steered for midstream, and passed, as did everything else floating on the river, into the mouth of the pī pi'nī. Within they found great quantities of dry wood, and also the bones of the people who had been devoured during the preceding years. These people were not food for this monster, but starved and thirsted to death inside him. Once within, the four shamans set fire to the dry driftwood and then proceeded with their palm-wood knives to cut out the vitals of the pī pi'nī. The heat of the fire caused the monster to vomit forth the four shamans, together with much of the driftwood and other things that had floated during all these years into his mouth. Thus the shamans escaped. The pi pī'nī had been killed, but continued to burn. The

shamans remained to see that every atom of the monster was consumed, for if even the smallest particle had remained a new pī pī'nī of as great or greater size would have grown from it. After this event the size of El Charco became what it is now, and a comparatively safe place to pass so far as supernatural dangers were concerned. As a matter of fact, however, at the present time it is a dangerous place in times of flood. There is a big bend in the river at this point, and a large pool with very strong eddies that make it necessary to use care in passing through it. 776

### INVISIBLE TREASURE

There are stories current among the Cayapa of great invisible treasures in the form of caves filled with gold and silver which are guarded by invisible spirits, each of which carries a golden wand or lance. A shaman once visited one of these treasure caves and was told by the guardian that he would be given its contents if he would bring to him in exchange a child, a white dog, and a white cock. Neither he nor any one else has ever yet brought these, and the cave of treasure still remains unclaimed.

## MYTHOLOGY

It is interesting to note that although there is such a highly-developed idea concerning local spirits, both malevolent and benevolent, and although these play an important part in the life of the people, almost nothing is obtainable in the way of myths. It seems strange 773

773 that with this highly-developed spirit concept there is not a similar development of related myths and tales, but no such special tales appear to be current among the Cayapa, and indeed the only resemblance to tales at all is the alleged experiences that certain individuals, during intoxication or sleep, claim to have had in their encounters with strange spirits.

773 825 There is nothing resembling a culture-hero cycle or any other cycle of myths. Animal stories, so common among aboriginal peoples, are almost unknown among the Cayapa. The two following short, fragmentary tales were the only ones obtained, and it is doubtful whether these are truly aboriginal with this people.

It is said that in ancient times birds and mammals had the power of speech, their language being that of the Cayapa. The toucan wore a silver necklace, and was constantly crying because there was no chonta dura to eat, although there was an abundance of other fruits. When he changed from his human form to his present bird form, his silver necklace became the white rim of feathers, which he now has, at the yellow throat patch, and his former crying for chonta dura he still keeps up in his constant propensity to give his characteristic call, "tcandō′tō," from which he derives his onomatopoetic name.

The jaguar also was formerly a human being who had a Cayapa wife. During the day he remained about the house in the ordinary manner and without wearing his shirt. At night, however, he put on a fine shirt ornamented in colors and went out to hunt. He killed much game, and ate the greater portion of it raw on the

spot. He brought home a small amount, but when it 773
was cooked and his wife called him to eat, he never appeared 825
hungry, consuming but a small amount and declaring that the food was not good. Later his form was changed to that which he now has, and he is obliged to walk on all four feet. His finely-colored shirt became his present spotted skin.

## CEREMONIAL OBSERVANCES

Of aboriginal ceremonies there are few traces left 177
among the Cayapa, so completely have the fiestas of the 796
church supplanted them. In these festivities there are certain remnants of aboriginal customs, but they are entirely subordinated to the practices of the Catholic church.

Contrary to the customs of many aboriginal peoples, 881
there are not at present, and apparently never have 844
been, any special ceremonial observances associated with 841
birth, puberty, and menstruation, although there are certain restrictions and slight observances of an ordinary character connected with each of these.

The marriage and mortuary ceremonies, already 177
described, are, on the other hand, quite elaborate, and 796
apparently retain much of their aboriginality, although largely assuming the nature of these ceremonies as celebrated by the church.

Two regular church festivals, that of "Noche Buena" or Christmas, and that of "Semana Santa" or Easter, are celebrated, as one might suppose, entirely according to church custom.

177 796 Another festival, having its origin in the Ecuadorian national holiday, August tenth, is also celebrated by the Cayapa, although the date of the event is never a fixed one with them. This is ordinarily the one time of the year when a priest visits the villages, and the date of its celebration depends largely on his convenience. However, regardless of the date of its celebration, this festival is always designated "La Fiesta de Agosto."

796 Usually combined with all these fiestas are what are called *bodas* and *ofrendas*. In its restricted sense the boda is a marriage ceremony or a marriage feast, while the ofrenda is the feast of the dead. The latter term is used in its more restricted sense among the Cayapa, and is a special feast held usually in honor of one or more relatives of the family giving the feast who have died within the previous twelve months, although such a feast may with equal propriety be held in honor of relatives long dead, especially if they had been notable people. The boda, on the other hand, partakes as much of the nature of a mortuary ceremony as of a marriage feast, and the word *boda* is used generally to include all kinds of feasting. At all gatherings of the Cayapa, regardless of their chief purpose, the people feast and dance a great deal, and much rum is consumed.

The three fiestas mentioned, as also the boda and the ofrenda, will be described from observations made on these ceremonies during 1908 and 1909.

### LA FIESTA DE SEMANA SANTA

"La Fiesta de Semana Santa," or the Easter festival, which is the most important and most elaborate of the fiestas of the Cayapa, illustrates the completeness with 796 which intrusive religious ideas may become engrafted on the beliefs of a primitive people.

As celebrated in 1909 at Punta Venado, this fiesta was of five days' duration, and in detail was as follows:

*First day. Hueves Santo, April eighth*

While many of the fiesteros reached the village on the previous day, a considerable number did not arrive until toward evening of this the first day of the fiesta. By evening, however, all had reached the village, and its population now aggregated about five hundred. On the first day there was no dancing or special feasting, but during the day several religious services were held in the church, consisting of simple "rosarios" said by one or another of the leading men of the village, or by one of the negroes present. The greater part of the day was spent by the men in completely clearing the plaza. Owing to the rapid and rank growth of vegetation, the entire village was overgrown with weeds, grass, shrubs, and vines, although it had been cleared to a considerable extent for the Christmas fiesta.

*Second day. Viernes Santo, April ninth*

The second day saw also no dancing or special feasting. Services similar to those of the first day were celebrated
in the church throughout the day. A large number of 796
banners were made of bandana handkerchiefs and bright- 373
colored cloth, and about twenty-five candle torches of bamboo were constructed. These torches were made by

796 fastening in pairs, on opposite sides of a long bamboo
373 pole, short joints of bamboo of the proper size to hold a
candle. Some torches had as many as fifteen of these
pairs of candle sockets, and in all there were spaces on
the torches for upward of five hundred lights. The
796 several stretchers used in carrying the images of saints
and also an image of Christ were newly draped and
prepared for use in the processions.

At about 7 o'clock P.M. criers were sent out to summon
the people to the church for the first of the more
important services of the fiesta, which everyone is
obliged to attend. By 7:30 all had assembled. The doors
were then closed and fastened, and guards placed over
them to prevent anyone from leaving during the service.
796 This rite was conducted by the sindico, or warden of the
795 church, assisted by some of the head-men of the village,
and at intervals as it progressed first one and then another
of the numerous candles about the altar were
extinguished until at last but one flame remained. This
the sindico took into the vestry behind the altar, leaving
the room in utter darkness, whereupon each of the men
and boys immediately produced one or two large paddle-shape
pieces of tough green bark, which he had kept
concealed upon his person, and proceeded to castigate
himself severely. The men all wore shirts made of light
calico or of bandana handkerchiefs. That they might
receive the full force of the punishment, however, each
man pulled his shirt up about his neck and struck himself
upon the bare back with his paddle. The blows
were delivered with great force, making a loud whacking
sound, but no severe pain was inflicted, as the paddles

EASTER FESTIVAL AT PUNTA VENADO

[P. 386 (A)]

3: Barrett E-5 (1908-1909) 1925
SD 6 Cayapa SD6

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[p. 386(a)]

FIRING "SALVOS" IN THE PLAZA

were flat and very wide. After about ten minutes of this 796
castigation, the sindico returned from the vestry with the 785
candle, the paddles were dropped, and all the men and
boys scurried off to the side and rear walls of the church.

This self-inflicted punishment is in this particular 171
region confined to the Indians alone. Although there 177
is a large negro population, and many negroes attend this 796
ceremony, none participate in this part of it. The negroes in certain other sections, namely, to the south of Esmeraldas, are said to inflict similar punishment on themselves, while those of some other parts are quite unacquainted with the custom. This, together with certain other observances, such as whipping with a cat-o'-nine-tails on Easter Sunday, may be due to the influence exerted over the Cayapa by early Catholic priests. That the same customs do not prevail among the negroes is due seemingly to the fact that at the time of the later influx of negro slaves, other orders and other church customs had superseded those which may have given these particular ideas to the Cayapa. It is possible also that in certain of these customs there is a vestige of some aboriginal ceremonial observances, but if so it is not now possible to segregate them.

On the return of the single light to the altar, several 796
other candles were lighted and the service was concluded
by further responsive chanting.

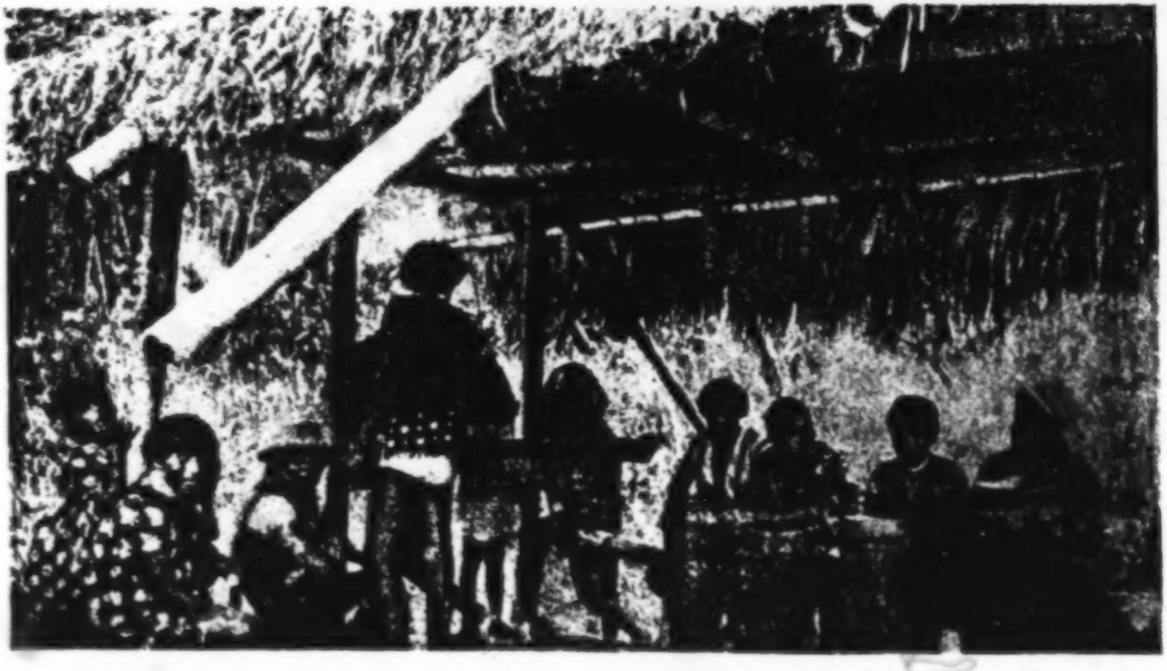
Next was formed a procession, in which practically everyone appeared, headed by bearers of a cross and images of saints, followed by bearers of the candle torches and the banners, and by a large number of other fiesteros. Each person, whether carrying anything else or not, bore

796 a short candle in one hand. In addition, a considerable space in front of the church was filled with row upon row of candles, and nearly all the houses in the pueblo, especially those near the church, were illuminated with candles. In all, not fewer than twelve or fifteen hundred candles were thus used. As is usual with such processions, there was much shooting of firearms in front of the church immediately before the procession came forth. After passing round the church and about the plaza, the procession returned to the edifice, where the images of the saints were redeposited at the altar, and the banners, and also the torches, which were still burning, were placed about the walls.

After the chanting of another rosario, two long spears were taken to the front of the church and crossed between the front house-posts, which were twenty feet apart and about fifteen feet back from the door. The spears were crossed at about a foot from their points, the shafts passing upward and their ends resting each upno the shoulder of a man at one of the posts. Directly behind the point where the spears crossed was placed a short piece of lighted candle, one that would burn out in twenty or thirty minutes. As such a piece of candle was consumed, two other men relieved the guards with the spears. These remained on duty during the burning of another candle, when they in turn were relieved. This guard, typifying the guard before the tomb of Christ, was maintained uninterruptedly until about 3:30 A.M., when the procession with the images of saints, the candle torches, and the banners, was repeated. For the exit and reëntrance of the procession, the guards with-

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

[p. 388(A)]



MUSIC IN A RANCHO

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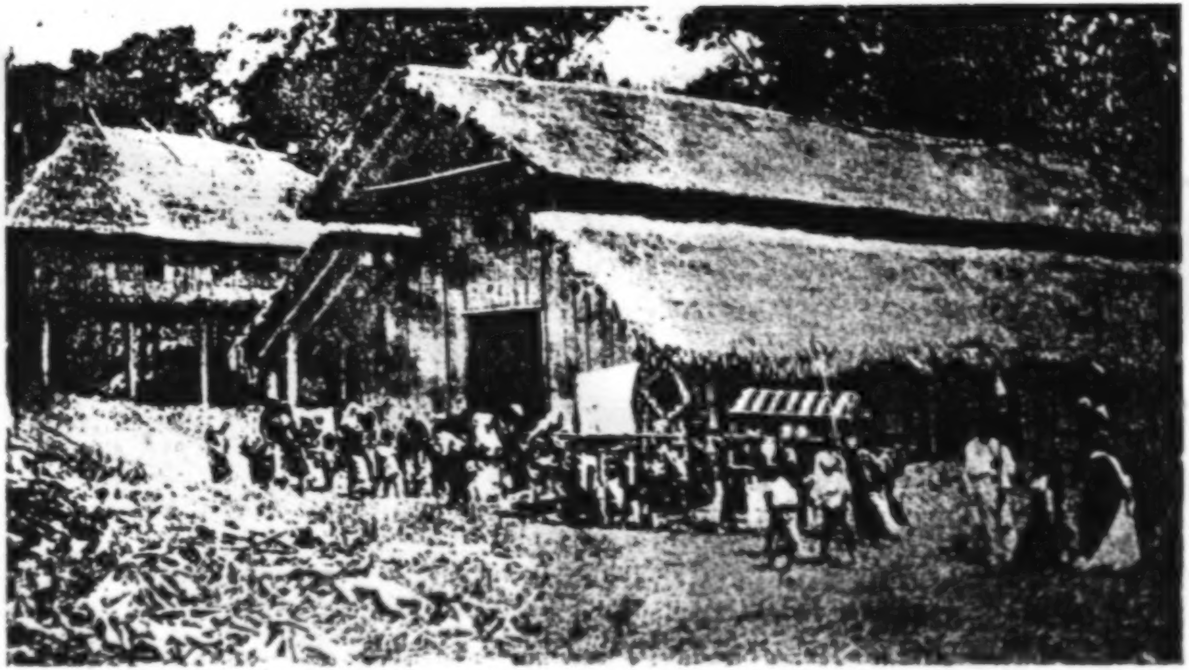
[p. 388(B)]



PROCESSION CIRCLING THE PLAZA

drew their spears and permitted passage through the central space between the house-posts. At all other times no one was permitted to pass between these posts, although frequent services were held throughout the night. 796

On the return of the procession to the church and the redepositing of the images, banners, and torches, the space between the house-posts was closed by the spears and the guard kept as before until about 7:30 A.M., when another service, a "gloria," was chanted. During this service the guards circled about each other, each slowly twirling his spear in the right hand, much as a man may twirl a cane. Toward the close of this service the spearmen mounted guard at each house-post, with the spears held vertically and with the points up, but after its conclusion the guard was no longer maintained.

*Third day. Sabado Santo, April tenth*

After the early morning ceremony above referred to, nothing other than the chanting of rosarios took place in the pueblo until about noon. A dance was then commenced in one of the houses and continued until nearly dawn of the following morning. [535

*Fourth day. Domingo de Pasqual, April eleventh*

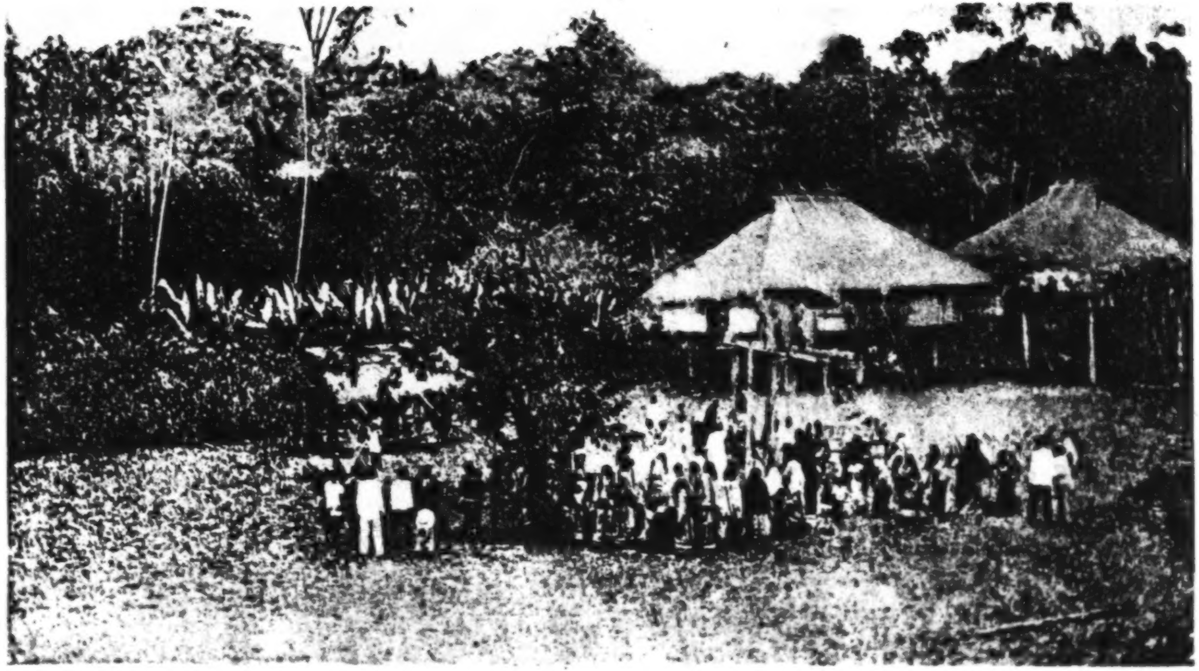
Shortly before dawn, four images of saints were placed in a small "rancho" in the plaza. Here also were brought the marimba, the drums, and the rattles used in the dance during the night. The exterior of this structure, with the rank growth of grass and weeds in the plaza about 796 342 [534]

3: Barrett E-5 (1908-1909) 1925
SD 6 Cayapa SD6

796 it, is shown in the background of pl. CXXXII. In pl. CXXXIII part of the structure is just visible below the 342 cloud of smoke before the church, and in pl. CXXXVI it is shown in the background. In both of these the plaza is shown completely cleared of vegetation as it appeared during this particular fiesta. The interior of the "rancho" with the instruments and their players is shown in pl. 796 CXXXIV. Here throughout the day, until about 4 P.M., the music was continued almost without cessation, regardless of the fact that services, processions, and feasts were at different times in progress in the pueblo. It is the custom to give the images guarapo to drink on this one day of the year, and this must be done very ceremoniously and with much music. The images themselves are supposed never to drink rum, nor is it drunk in their presence, but great quantities of guarapo are consumed actually by the fiesteros as well as ceremonially by the images. A small calabash is filled with this drink and is held to the lips of the image for some minutes, or if the image is so placed that the calabash cannot, be placed to its lips, they are moistened with guarapo by dipping the finger into the liquid. The images having been allowed to imbibe from this calabash, its contents are either thrown on the ground or drunk by some of those present. In addition, other guarapo is constantly drunk by the fiesteros. Almost no rum is drunk in the [576] vicinity of the "rancho," but in case it is desired to drink rum, etiquette requires that a person must turn away from the saints, otherwise they would be displeased at the sight.

At about 8:30 A.M. a service was held in the church,

[p. 390(a)]



PANTOMIME OF THE ANGEL DESCENDING TO THE TOMB

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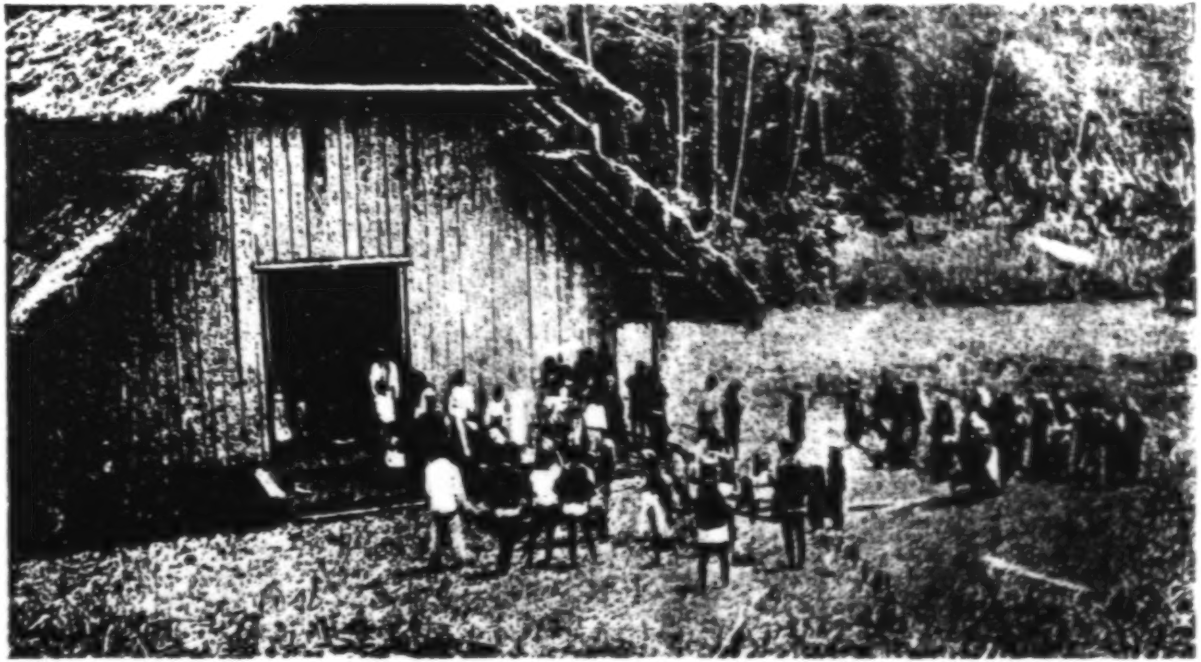
[p. 390(B)]



PROCESSION REENTERING THE CHURCH

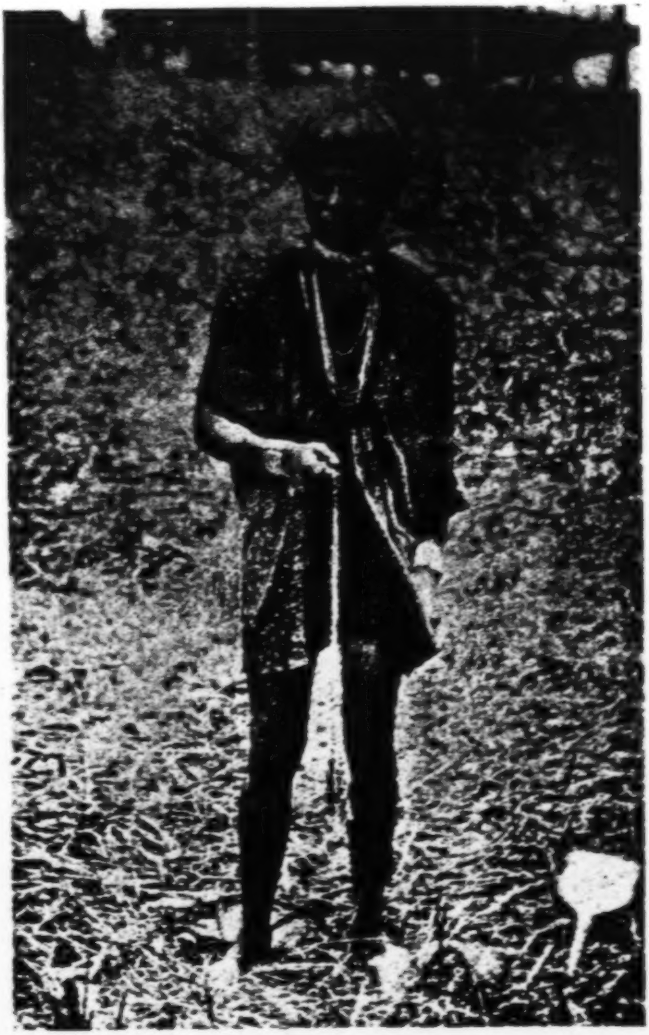
followed by an ofrenda, or feast for the dead, in one of the houses, and simultaneously by a procession about the village, some attending one and some the other. The procession was similar to those held during the night, except for the absence of the candle torches and the addition of a pantomime of the descent of an angel upon the tomb of Christ.

Among the Cayapa there is celebrated on this particular day a kind of passion play in which an attempt is made to act out in a small way the resurrection of Christ. In the center of the plaza, and not far from the "rancho" where the saints were drinking guarapo, was a scaffold about fourteen feet in height, in the floor of which was an opening through which a small boy, dressed in full European costume of white cloth and with white-cotton imitations of the wings and tail of a bird, was lowered by means of a rope upon a representation of the tomb of Christ. This tomb was a kind of box made of slats carved in ornamental forms, in which rested an image of Christ and over which a black cloth had been placed. As the boy who impersonated the angel was lowered from the staging by a couple of men, he extended his arms and legs as a bird might extend its wings and tail, and, nearing the tomb, he siezed in his mouth the black cloth and was drawn back to the staging, typifying the return of the angel to the sky. In pl. CXXXVI is shown part of this scene. The boy dressed in white and holding the black cloth obtained in his descent upon the "tomb" may be seen standing with the two men on the scaffold. The "tomb" is just being removed from under the scaffold. The procession then wended its way, circling round the

796 church, as shown in pl. CXXXV, and passing again down the plaza, this time to the "rancho," which it circled, finally returning and reëntering the church (pl. CXXXVII).

796 785 At about 10 A.M. the sub-chief took his place at the extreme left of the altar, and criers were sent to summon all to the church for the annual castigation with the cat-o'-nine-tails, which punishment is obligatory upon all the Indians, both old and young. This ceremony, however, is never participated in by the negroes. If a man, the devotee bows or sits upon the left heel; if a woman, she bows or sits before the altar and receives one or more strokes from the cat-o'-nine-tails, which always has five points, so that each stroke counts as five lashes. The devotee must receive one stroke, and may take as many more as he desires. Often a person takes two or three strokes, and later returns once or even several times for an equal number. The castigator uses discretion in inflicting the punishment—to an adult he admisters blows with full force, but to a child the blow is light. The men come in their usual attire and receive their lashes upon the thin and very tightly drawn clout. The women, on the other hand, dress especially for the occasion, putting on always a calico or bandana covering to completely hide the face and the upper part of the body and wearing their newest and best manta. Frequently several mantas are worn one outside the other, for protection against the blows. It is customary for the women to make and to keep a manta for this special occasion and which after the ceremony may be worn every day, but it must never be worn before the ceremony. Comparatively small boys and girls come vol-

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6



796
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CASTIGATOR WITH CAT-O'-NINE-TAILS

[p. 372(A)]

3: Barrett E-5 (1908-1909) 1925
SD6 Cayapa SD6

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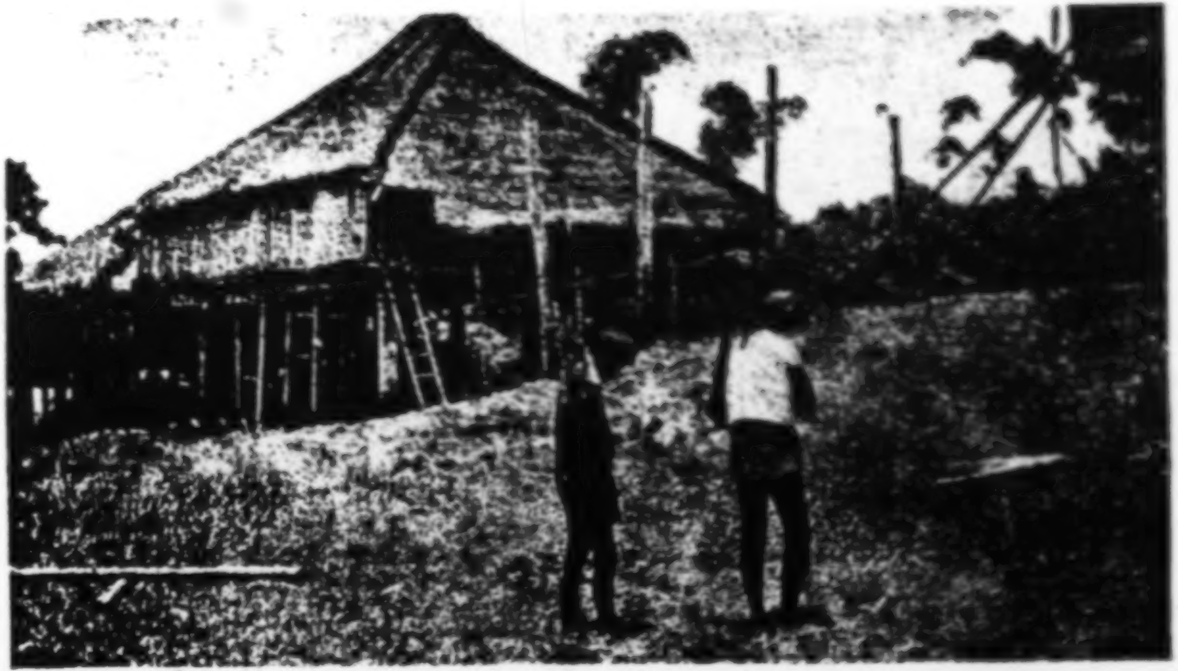
[p. 392(B)]



THE CEREMONIAL WHIPPING

untarily for this castigation, but children of from two 796
to five years are usually accompanied. If necessary 785
they are brought forcibly by their elders. The very
small children generally receive but a light tap from the
castigator.

A few minutes after the castigation at the altar commenced, an assistant took up his position just outside the door of the church and there administered punishment to any who desired it, after which they were at liberty to enter and receive still more at the altar if they desired, although this was not necessary. Pl. CXXXVII presents a
view of this castigator with his cat-o'-nine-tails. Pl. [284]
CXXXIX, 2, shows him in the act of striking a devotee. In
actual practice this was done at the door of the church.
These two pictures, however, were posed at a short
distance from the building in order to gain a better light. [284]
Fig. 28 shows the technic of cording on the whip.

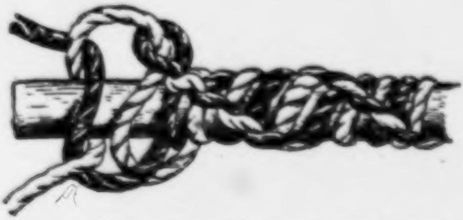


FIG. 28.—Technic of cording on cat-o'-nine-tails

By 11:30 the castigation of the devotees was finished and the second ofrenda of the day was called. Nearly everyone attended, but a few remained at the "rancho" to play before the saintly images there.

At about 4 P.M. the saints from the "rancho" were re- 796

796 turned with proper ceremony to the church, and the ceremonies of the fiesta proper were ended.

The night was spent in dancing, although this was not an essential part of the ceremony. By evening of the following day (Monday) all the fiesteros had started toward their homes, and some even left the village during the afternoon of Sunday.

796 484 This fiesta[1] is the most important of all the gatherings of the Cayapa and is one which almost all attend even though they may be so situated that the journey to their particular village is a difficult one, and may never attend the other gatherings of the year. Even those Cayapa who live on the Rio Verde and at other distant points endeavor to return to their old home village to celebrate this particular ceremony.

## La Fiesta de Noche Buena

796 "La fiesta de Noche Buena," or the Christmas festival, is the less important of the two strictly religious ceremonies of the Cayapa, and, while the services are held by the sindico, or guardian of the church, and by others, these are not so elaborate as are those held at Semana Santa just described, and less interest is displayed. All these services and indeed the entire conduct of the fiesta are almost identical with those of Semana Santa, except that various of the ceremonies and processions, especially those concerned with enacting the resurrection of Christ, are absent, as is also the ceremonial drinking by the images of saints. There is much dancing both day and night, and there are frequent feasts, some being

[1] [i.e., Easter. --- Analyst]

796

of the type known as bodas and others of the type known as ofrendas, given by different persons.

[626]

This is one of the principal times when offenders against tribal laws are punished, although they may be punished with equal effect at any other public gathering. This fiesta usually lasts from three days to a week.

### LA FIESTA DE AGOSTO

As before stated, the date of the Fiesta de Agosto is quite irregular, depending largely on the convenience of the priest who is to attend. The whole fiesta had its origin in the Ecuadorian national holiday, August tenth, and by the whites and negroes of other parts of the province it is celebrated always on that date. Among the Cayapa, however, this festival takes the place of the Easter fiesta as celebrated among the whites and negroes, in so far as the services of the priest are concerned. Whereas he always celebrates Easter at some point near the coast, and the whites and negroes almost always attend, the Cayapa await the arrival of the priest at their own villages for any such special services.

At a time when they know that the priest is in one of the villages at the mouth of the river, usually the village of La Tola, during the late summer or early autumn, a deputation is sent by the Cayapa to invite the priest to come to their villages to hold this annual fiesta. Governed largely by other engagements, the priest appoints a time when he will be able to be present; the Cayapa officials then notify all the people of a given village to assemble at that particular time. A day or so

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

796 before the appointed time a large canoe manned by a deputation of Cayapa is sent by the chief to La Tola, or wherever the priest may happen to be residing at the time, and he is brought up. His arrival at the pueblo is usually preceded by the gathering of practically all the Cayapa who can attend the fiesta, although some stragglers may not appear until the following day.

796] In each of the three Cayapa villages there is a special house, known by the Spanish term convento ("monastery"), which is reserved for the priest and at no time is ever occupied by anyone else. After establishing himself the priest usually goes directly to the church and holds the first service, and thereafter throughout his stay he is kept busy holding services of one kind or [765] another. Usually two regular services are held each day, besides the various special masses for the repose of the souls of the dead, especially those who have died within the year. In addition to these services the priest officiates at all the marriages, baptisms, and confirmations for the year past. He remains usually from a week to two weeks at each of the three Cayapa villages, depending on the interest of the Indians and the apparent need of his presence.

As in each of the other fiestas described, ofrendas and bodas are held almost every day, and sometimes several in a single day. Except in one particular these are the same as the ofrendas and bodas at the other fiestas and those celebrated between times. On this occasion every one who intends to give a feast usually brings to the morning service in the church a small portion or several small portions of each kind of food to be used at the feast.

These are placed on a table specially provided for the 796
purpose in the center of the church, and a particular blessing is given these by the priest during the service. They are then usually taken to the convento as a gift to the priest, or they may be taken back to the feasting table.

During his entire stay the priest is provided by the Cayapa with an abundance of all kinds of native foods. Every morning quantities of plantains, yuca, fruits, game, and fish are taken to the convento, and in every way the Cayapa see that he is abundantly supplied. In addition, of course, he is paid in money by them for the various masses and special services which he conducts.

## Boda

In the strictest sense of the term, a boda is a marriage 796
feast or ceremony. Among the Cayapa, however, it 585
has attained in addition a more general signification, 765
being applied to any gathering at which there is feasting and dancing, but which is without special church services such as are held in the fiestas. A boda therefore usually includes, besides the ordinary feasts proper, other special feasts known as ofrendas, which are really feasts for the dead. In addition there are usually held certain 796
simple church services which do not require the presence of a priest. Usually a number of bodas are held during the course of the year. Each in a way is a personal or family festival, and is almost always given by one, or not more than two, families. They are all practically alike in their essential features. A detailed description of one will give an adequate idea of all.

3: Barrett E-5 (1908-1909) 1925
SD6 Cayapa SD6

796 A boda held from January seventh to tenth, 1909, was as follows:

At the Christmas fiesta announcement was made that two certain families would give a boda on January seventh. Meanwhile the members of these families commenced to accumulate the provisions for the feasts. Much hunting and fishing and drying of meat were done; rum was distilled; vegetal foods were procured; and, not the least in importance, a trip was made to the ocean to procure shellfish and crabs. On the afternoon of January seventh, accordingly, a considerable number of people assembled, still others coming in on the following day. No feasts or special ceremonies were held until the next day.

### *First day. January eighth, 1909*

At about 9 A.M. a service was conducted in the church, followed by feasts in one of the houses of the village.

The first of these feasts was an ofrenda. While the service was being held in the church, the members of the family, assisted by friends, were placing upon the table all the food which had been prepared the night before. The table, as usual, was prepared by spreading upon a considerable area of the floor a covering of the large leaves of hoja blanca, and upon these were placed all manner of eatables. Liquids or semi-liquids were contained in pottery or calabash dishes, and dry foods were placed directly upon the leaves. There were many of
796 the various mammals, birds, and fishes of the region
252 dried and smoked until almost jet black; monkeys,
262 guatins, squirrels, zorras, woodrats, and other mammals

dried whole; and guantas, deer, jaguars, pumas, armadillos, 796
sloths, and wild hogs, all in dismembered parts. 252
Among the birds were parrots, toucans, doves, grouse, 262
wild turkeys, herons, and egrets, all dried whole. Dried
fish of various species, especially the shad, were present.
In vegetal foods also there was great variety, as the 796
plantain, yuca, papaya, rascadera, sugar-cane, coconut, 262
guabo, zapote, bread-fruit, orange, chonta dura, and
palma real. Care was taken in arranging the table to
see that there should be as much display as possible.
The dried mammals and birds were in many cases placed
in erect poses, and fruits or pieces of other foods were
placed in the beaks of the birds and in the mouths or
between the paws of the mammals. In one or two
instances mammals were so posed as to appear as if
fighting.

Directly after the service in the church, to which a 796
small portion of the food was taken in order that by its
presence during the service it might receive the blessing
for all the food used in the feast, all the people of the
village congregated at this particular house. The men
and larger boys occupied the room in which the table
was spread, and the women, girls, and small boys the
room adjoining. The givers of the feast then presented 796
to whomsoever they thought proper various articles from 431
the table, such as a dried mammal, bird, or fish, and some
fruit. These were for the recipients personally, and
were to be taken home by them. On receiving such a gift,
a man always took it personally or sent it to some of the
women of his family in the adjoining room. This
division of the food took a considerable part of what was

796 upon the table; the rest was divided into small bits, and, [451] after an invocation by the warden of the church, the men and boys, all seated on low benches about the table, proceeded to feast. The women meanwhile partook of a portion of the food that had been sent to the next room to them. Having finished the meal, a benediction was pronounced by the warden and the floor was cleared of all scraps of food and the leaves forming the table.

Immediately fresh leaves were spread as at first, and the boda, the word being here used in its more restricted [252 262] sense, was served. While an ofrenda has a very elaborate assortment of foods, a boda has only fish, oysters, or meats cooked in ripe plantain in the form of a thick gruel. [415] This is served always in the aboriginal pottery plates of the kind shown in pl. LXXXVII, 4, although for everyday use dishes of European manufacture have almost entirely supplanted the pottery plates formerly used. In this particular case the boda consisted of a single course of plantain and fish, but sometimes other courses are served in order. The feast having been finished, the majority of the people went to their respective abodes in the village or to the house of the chief.

796 627 622 At such gatherings offenders against the law are usually brought before the chief, by whom justice is dispensed and differences between individuals adjudicated. On this particular occasion several matters of this nature demanded the chief's attention. The details of these will show something of the methods of dispensing justice among the Cayapa.

627 694 796 Immediately after the boda on this first day the chief sent some officers to bring before him certain offenders

against the law. The offenders were, in this case, a 627
man and a woman. The man had deserted his wife and 684
child after abusing them for a considerable time and had 796
assumed relations with a young widow. He had therefore been guilty not only of infidelity and abuse, but also of violating the immutable law forbidding divorce. The woman's crime was somewhat less grave. Being a widow, she had a right to remarry, but she had no claim to the husband of another woman. In justice to the Cayapa as a tribe it should here be remarked, as has been elsewhere pointed out, that cases of infidelity, wife-desertion, and abuse are extremely rare. Almost without exception the family relations are held sacred by both men and women, and in general the relations existing between the sexes are governed by stringent laws
which are regarded faithfully. In this instance both the 627
offenders were brought to the house of the chief and were 696
placed in the stocks where they remained during the afternoon. The man displayed no sign of emotion, but the woman wailed and chanted the greater part of the time. Both were remonstrated with by friends, and the mother of the woman sat beside her almost constantly, weeping and chanting her plaint at the disgrace that had been brought upon the family by the daughter's misconduct.

It would appear that the keeping of such offenders for many hours in the stocks is an exemplary measure and is done for the effect which it will have on the community at large. The punishment which they are to receive is often decided on long before its infliction, but they are kept in the stocks as an example to the people at large

627 796 and especially to the younger generation, and their conduct is discussed both privately and publicly throughout the village and its evils are pointed out. Especially is this done by the public utterances of officials, who speak in the large hall in the chief's house where the offenders are incarcerated.

Toward evening the prisoners were released from the stocks and permitted, under guard, to take food, being later returned to the stocks. About nine o'clock a gathering assembled in the room, the man was taken from the stocks, and several of the officials, including the chief, made short speeches concerning the pair and their crime. One of the speakers was a woman, a relative of one of the offenders. At last the sub-chief spoke rapidly and eloquently for about twenty minutes, berating the man for his conduct and his disobedience to the laws of tribal society.

Finally the commission of officers who had been sent in the morning to bring the two for punishment was called forth and its leader gave a ritualistic invocation, after which the offending man was brought forward and made to stand before the stocks with his body inclined slightly forward. The chief then administered fifteen strokes with the cat-o'-nine-tails, the equivalent of seventy-five lashes. The culprit was destined to receive a greater number of strokes, but owing to the chief's infirmity due to a recent gun-shot wound, and to the fact that the culprit proposed to buy partial immunity with rum for the assemblage, he was given his liberty after receiving the punishment noted.

The woman was then brought forward and received

The woman was then brought forward and received ten strokes, or fifty lashes. Her case, however, was different from that of the man, and she was not then set at liberty. By living with the man she signified her desire to marry, hence it was determined that a husband should be found for her. She was therefore placed under a guard of three officers for the night, while the officials set about to find a man who would consent to take her as his wife. She was thus held in custody until January eleventh. Meantime an old man living on the Rio Camarones was found who was willing to marry her. As a matter of fact, her relatives had tried to arrange the same marriage some months before, but as she was unwilling to marry the old man, the priest had refused on his last visit to the village in October, to perform the ceremony. When the boda ended on the afternoon of January tenth the woman was given into the custody of the chief's wife, being held in the chief's house until the following morning, when a commission of three officers called for her and delivered her to the old man who was supposedly destined to become her husband. As a matter of fact, she remained with him only a few days, when she and her paramour stole away to parts unknown. 796 627 587

*Second day. January ninth, 1909*

A short service was held as usual in the church, followed by another ofrenda. This was marked by disorder in dividing the food, everyone grabbing for what he considered a proper share. This was in very bad taste, according to Cayapa etiquette, and was loudly condemned by the older men. This misbehavior was prob- 796 [264]

3: Barrett E-5 (1908-1909) 1925
SD 6 Cayapa SD6

796 ably due in part to the increased drunkenness, which was apparent throughout the day, but was due more largely to the greed of several negroes present.

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796 After this feast the floor was cleared of remnants of the meal and of the leaves used to make the table. The second feast, the boda, was then served as usual. This consisted of three courses, each served on the same plate in the case of each individual, care being used in replenishing the supply that the plates of different individuals should not be interchanged. The three courses
[262] of these mush-like foods consisted of plantain with fish, plantain with meat, and plantain with oysters. In case any individual did not eat any or all of his portion, it was taken to the next room by the host or by one of the attendants and given to one of the women of his family. The men giving the boda served the guests, while the women attended to filling the plates.

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252 In this particular instance the whole of the previous night had been spent by the hostess and her friends in cooking and preparing the plantain mushes used in this boda. While hot they were poured into burden-baskets lined with leaves. When served they were cold and very thick.

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684 Immediately following the feasts another refractory pair were brought to justice. In this case the man had forsaken his wife and for three months had been living with his first cousin, who had deserted her husband. Each of the culprits, therefore, was charged with the double crime of desertion of spouse and cohabitation with first cousin. These are considered great breaches of tribal law and are severely punished. As on the previous day,

3: Barrett E-5 (1908-1909) 1925
SD 6 Cayapa SD6

the offenders were placed in the stocks, remonstrated with by relatives and friends, and finally whipped. In this case the man received a hundred and seventy-five lashes, or thirty-five strokes of the cat-o'-nine-tails, and in addition was required to pay a fine in money amounting to about fifteen or twenty sucres. The woman's punishment was a hundred and twenty-five lashes, or twenty-five strokes. The greater severity of the punishment in the cases of these two offenders was due to the fact that they were first cousins, which relationship prohibits marriage under any consideration. 796 627 684

Another example of punishment was witnessed late in the afternoon. A young man had inbided freely and while in his cups ran amuck in two or three houses. Others endeavored to quiet him, and to hold him and prevent serious trouble, but he seemed crazed with the rum and determined to fight, until finally it became necessary for officers to take him in hand. After a struggle he was carried to the stocks and secured by one foot. He fought desperately to release himself, but finally fell asleep and after several hours awoke in a much better mood. 796 627 273

In this instance was shown a good example of the devotion of the Cayapa women. Throughout his drunken frenzy the young man's mother had endeavored to quiet him, and for her trouble been struck by him repeatedly. Nevertheless, as soon as he quieted down in the stocks she took up her station beside him and fanned him almost continuously during the time he slept. Such instances are very common. It is not considered a disgrace for anyone, either man or woman, to become intoxicated,

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273 and the care of those who are sober is to see that a person does no serious damage while in that state. The rum used produces a cycle of symptoms, beginning with jollity and loquacity, passing through a desire to display skill, such as bending hands with an opponent, and ending with a frenzied desire to fight. It is then that the women usually take a hand and try to pacify the men. Sometimes several women are required to hold a drunken man and prevent serious trouble.

In the case of the young man above mentioned, no further punishment was inflicted. When he awoke in a fairly sober state he was taken before the chief, who lectured him on the error of his ways, and warned that if he repeated the offense he would be castigated and fined.

*Third day. January tenth, 1909*

796 A brief church service, preceded and followed by a procession about the plaza, was held in the forenoon as on the two previous days, and was followed by an ofrenda and a boda. Whereas on the two previous days the ofrendas had been more for the dead in general, in this case there was a feast for a person who recently had died. This fact brought out another interesting custom. After [785] the feasting (both the ofrenda and the boda) was finished, the sub-chief took his position at one end of the hall and administered a stroke or two with the cat-o'-nine-tails to each member of the family who had given the feast, and many others presented themselves for similar castigation, but it was compulsory only with the members of the immediate family and their relatives.

3: Barrett E-5 (1908-1909) 1925
SD 6 Cayapa SD6

During the feasts the cat-o'-nine-tails used for the castigation, together with various articles of apparel of the deceased and certain articles given for the purpose by relatives, was suspended upon a pitigua cord over the table. These articles were later distributed among some of the guests not related to the family. 796

After these feasts and the attendant ceremonies many of the people went again to the chief's house. The same pair of culprits who received punishment the day before were again brought in, placed in the stocks, and later castigated. The woman received twenty-five strokes, or a hundred and twenty-five lashes with the cat-o'-nine-tails, while the man was given between thirty and forty strokes. The whipping of the man was due chiefly to the fact that he still refused to return to his lawful family. Even after he had been thus severely whipped by some of the officers a second time and was brought before the chief, he refused to return to his family. The chief and others argued with him and tried again to persuade him to see the error of his way, but he stoutly maintained that he would not return, and the chief finally became so vexed that he gave the culprit a couple of resounding slaps on the side of the head and remanded him to the stocks where he remained nearly the rest of the day. Toward evening he was liberated and was not further punished. It is very unusual for the chief to slap a culprit, and such an act is done only under great provocation. In the case of almost anyone else, such a slap would be highly resented and would result in a fight, but a culprit does not dare offer resistance to the chief under such circumstances. 796 627

## PHYSICAL ANTHROPOLOGY

### General Characteristics

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The measurements of seventy individuals which follow were made during the last days of the stay among the Cayapa. On departing from New York for this region no anthropometric instruments were available, and arrangements were made to have a set sent later. However, month after month having passed without the arrival of the instruments, it became necessary, near the latter part of the stay, to make them. Through the kindness of Señor Don Donato Yannuzzelli, owner of the Hacienda of Palma, the author was enabled to make a serviceable measuring rod in the shops connected with Señor Yannuzzelli's sawmill. For this purpose a thoroughly seasoned piece of hardwood called in Spanish guayacan was procured and sized with exactness. This was then carefully graduated with a metric rule and when provided with a spring-arm made a serviceable instrument.

Care was always taken to keep the rod from getting wet or subject to conditions that would tend to change its length. After the completion of the measurements the rod was proved with metric rules to make sure that no change in length had taken place. This rod, a pair of calipers lent by Señor Yannuzzelli, and a small thirty-centimeter rule, provided the instruments necessary for the work, and it was possible with these in a short time to procure the measurements here presented.

In the majority of cases the Indians submitted readily to measurement, and had more time been available it

would have been possible to obtain a much more complete 114
series. However, with this series of seventy measure- 141
ments, of which thirty-six represent males and thirty-four females (including nineteen adult males and twenty-one adult females), it is possible to arrive at a fairly clear conception of the physical characteristics of the Cayapa as a tribe. These measurements and the indices computed from them appear in tabular form in the following pages.

The tables of measurements and indices show that the 141
Cayapa on the whole are short in stature, the men averaging only 155 cm. and the women only 146 cm. The range of individual variation among the men, as also among the women, is 14 cm. Among the men there are at least a few individuals who appeared to be somewhat taller than the maximum here given, but as a tribe the Cayapa must be considered somewhat below the average in stature. The difference in stature between men and women is 11.27 cm.; that is to say, the men are 7.7 percent. taller than the women. Considering the fact that the Cayapa as a tribe are low in stature, this is a high percentage. In fact in most races of low stature this difference usually approaches 5 percent. of the female stature. Larger series would probably alter these results somewhat, but it seems probable that they would remain substantially the same since the individuals measured, of both sexes, were about the average of the tribe as a whole.

According to the averages of the cephalic indices of all four classes, men, boys, women, and girls, the Cayapa are clearly brachycephalic. Further, when the indi-

141 vidual measurements themselves are considered, the boys, women, and girls clearly fall into this division, for there are in these three classes fourteen, seventeen, and eleven individuals respectively who are brachycephalic, as against three, four, and two who are mesocephalic, these nine only being below 83.33. In the case of the men, however, there is a slightly greater number of mesocephalic than of brachycephalic individuals, the numbers being ten and nine respectively. That the average index of the men falls within the brachycephalic division is due to the fact that the mesocephalic measurements, though greater in number, approach the brachycephalic limit, while six of the nine brachycephalic measurements are well up in that division, ranging from 87.5 to 90.5. This makes the average high and brings the class of men also just within brachycephaly.

Considering now the relations of these measurements from the standpoint of the interrelations of sex and age, we find that the heads of the men, with an average index of 83.58, are materially longer than those of the women, with an average index of 86.85. This is due to the fact that the head of the man is of much greater actual length (10 mm.) than that of the woman, while the actual width of the man's head differs comparatively little (only 2 mm.) from that of the woman.

Among the boys, however, this index, which is 86.37, approaches very nearly that of the women, and differs less than one degree from that of the girls, which is 87.30. Some discrepancy arises in this case from the fact that these averages are derived from different numbers of individuals (17 boys and 13 girls) and also because there are certain differences of age, the girls being on the whole 141 somewhat older than the boys. To obviate this a computation has been made in which the last 13 measurements of boys (nos. 5–17) only have been taken. As it happens, these measurements are of individuals more nearly of the same age of the thirteen girls measured, and the element of extreme youth among the boys is thus eliminated. This computation gives an index of 86.04, which still leaves the index of the boys much nearer that of the women than that of the men, the differences being 0.71 and 2.46 respectively.

It would appear therefore that the head proportions among the adult females differ very little from those of childhood, while in the males the head has a marked tendency to elongate with advancing years.

While dealing with the physical characteristics of 142 the Cayapa it should be noted that in certain of those outward characteristics which are most manifest to the eye, the individual differences are very great. The hair varies from jet-black to a very dark-brown in color, and from absolute straightness to a very pleasing waviness, though in no case is there any near approach to curliness. It is ordinarily fine, though among the men some individuals are found whose hair is moderately coarse. These features are, of course, more noticeable in the 142 women that in the men, since the women always wear 302 their hair long and flowing, whereas the men keep their hair cropped fairly short, though in earlier times they too wore long hair. In many cases the women's hair reaches to the waist, and is very full and heavy. Such, for instance, is the case with the middle-aged woman

142 shown in pl. xx. Under ordinary circumstances most
302 women wear their hair full-length in this way, but
frequently a case (as in pl. xix) is found where the hair
[765] is comparatively short. This is due to the custom of
cropping the hair on the death of a relative. An example
of waviness of the hair is given in the case of the woman
shown in the latter plate. The hair in this case is dark-
142 brown. With advancing years the hair tends to become
143 thinner, but no case of even partial baldness was observ-
able either among the men or the women. Throughout
life the hair retains its color in almost every instance,
but rarely a person is seen who shows a sign of grayness,
and one old man was found whose hair was white—it
had become thus many years before, though no one
knew the cause. No other individual with white or
even partially white hair was encountered, and it was
claimed by the Indians that the old man referred to was
the only individual in the tribe who exhibited this
[2917] peculiarity. The fact that the hair retains its color so
well is probably due to the fact that the Cayapa prac-
tically never wear any form of head-covering.

142 Considerable variations are found in the form of the nose. In some it is wide and rather flat toward its tip, this appearance being due to a considerable distension of the nostrils, the openings of the nostrils being in many cases quite round. However, it escapes completely any approach to the true mongoloid type from the fact that in no case is there such a lack of bridge as is found in the real mongoloid nose. In fact, the contrary is quite the case, and in many instances the bridge is quite high, giving the nose the impression of slight aquilinity.

3: Barrett E-5 (1908-1909) 1925
SD 6 Cayapa SD6

142

One individual was observed whose bridge was quite high and aquiline, though this was a decided exception. In these high-bridged noses the actual width of the nose at the alæ is usually somewhat less than in the more monogoloid type above mentioned.

So far as noted, the eyes are invariably dark-brown, and the upper lids often show more or less of the mongoloid fold. In some instances this fold is so marked as to give the eyes a perceptible slant. In many other individuals, on the other hand, the fold is so slight as to be almost unnoticeable, and the eyes are wide and frank in consequence. In most cases the supraorbital ridges are not at all prominent; the forehead therefore appears full and is also fairly high. Now and then is found an individual, especially among the men, whose supraorbital ridges are fairly pronounced. The eyebrows are usually black, but are only moderately heavy.

In almost every case the malars are high and prominent, and the general appearance of the face as a whole is round, though now and then is seen a person whose face gives the appearance of much greater length than breadth.

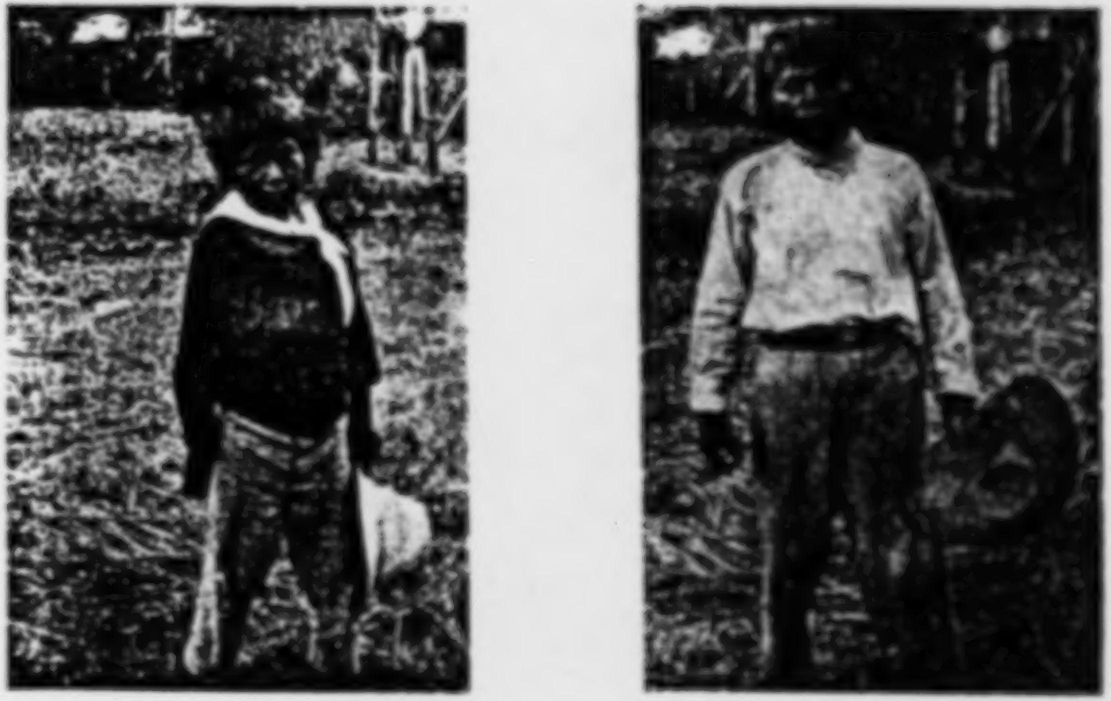
In the majority of individuals the upper lip is fairly broad and heavy, though the lips are in no case unusually thick. In most instances the chin has moderate prominence, though it never shows any special degree of protrusion.

No opportunity was presented for actually weighing any individuals, but from their general appearance it may be said that as a rule they tend neither to obesity nor to thinness. Now and then slightly obese or slightly

142 spare individuals are found, but as a rule they are in that state which would be termed "in good flesh." It is noticeable, however, among the very young children that there is a marked protrusion of the abdomen. In most cases this may probably be ascribed to the fact that their diet consists very largely of green plantains and that they devour these in quantities at all times of day; however, it must be said that no illness seems to result from this practice. As the children advance in years this protrusion of the abdomen grows less, and during the greater part of their remaining years they are well proportioned in every respect. Now and then is encountered an old person who tends toward protrusion of the abdomen in declining years, but these instances are exceptional.

In color the Cayapa are a fairly light reddish-brown. They are, in fact, much lighter than the average of the North American Indians, and it seems probable that the climatic conditions under which they live have at least something to do with this particular feature. As was stated in speaking of the climatic conditions in the Cayapa country, the sky is almost continuously overcast, the sun rarely shining brightly for more than a few minutes at a time. Even these short intervals of sunshine are very infrequent, sometimes weeks and even months passing without full sunshine. Furthermore, the Cayapa region is almost windless. While rains are practically of daily occurrence, they are almost never accompanied with wind or other storm features. Tanning from sun or wind is therefore practically impossible so long as the Cayapa remain at home.

[p.414(a)]



CHOLO BOYS

327

3: Barrett E-5 (1908-1909) 1925
SD 6 Cayapa SD6
Cholo

142 464 An interesting example of the possible differences in skin color is shown, however, when any of the Indians journey to the coast, and especially if they voyage a considerable distance at sea, which they frequently do when some of them have occasion to visit Tumaco or Esmeraldas. On such occasions they take their canoes [505] out to sea and paddle, skirting the shore-line for a considerable number of miles. The trip from Limones to Esmeraldas necessitates a journey of about fifty miles on the open sea, and ordinarily requires at least a week. [282] For such trips the Cayapa usually dress specially, in that they put on extra necklaces, neckbands, and wristbands, and otherwise ornament themselves for the occasion. Their tight-fitting neckbands and wristbands are never taken off while they are away from home, consequently the portions of the skin covered by them are protected from the influence of the elements. When they return home, however, this finery is usually taken off. The 142 contrast between the covered portions of skin and the exposed parts is striking, even though the intervals of sunshine along the coast are practically as infrequent as along the river. The sea breeze has a marked tanning effect, consequently the traveler returns home almost as brown as many of our North American Indians who are subjected to sun and wind during much of the year. The covered portions of the skin, however, remain the same color as when the Cayapa leaves home, and it is therefore possible to contrast the natural color with the tan. No color charts were available for purposes of comparison and exact record, but the differences between these two tints are considerable and show the natural color of the Cayapa, as previously mentioned, to be

3: Barrett E-5 (1908-1909) 1925

SD6 Cayapa SD6

Cholo

142 much lighter than that of the average North American Indians.

In a word, therefore, the Cayapa may be said to be a well proportioned, though somewhat undersized, light-brown people, with brachycephalic heads, black or dark-brown hair which varies from straight to wavy, to show considerable variation in the shape of the nose, to have very dark-brown eyes, wide upper lips, full and fairly high foreheads, high cheekbones and round faces, and to have supraorbital ridges and chins that are not at all prominent.

No opportunity was presented to measure the few Cholo who live on the Rio Cayapas. They are, however, of quite a different type from the Cayapa, being somewhat shorter and more thick-set than the latter, and as a rule more mongoloid in general appearance. In pls. CXL-CXLII are shown two boys, two girls, and one young man of about twenty-one years, all members of this tribe.

## MEASUREMENTS

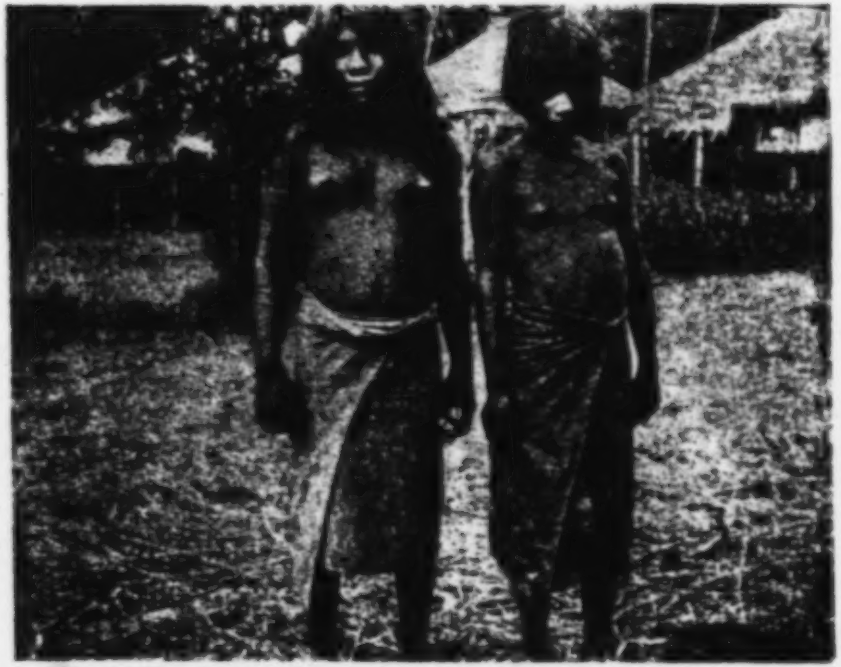
[illegible] In the accompanying tables the following abbreviations are used:
129

*St*, Stature.

*Str*, Stretch of arms.

*Sh*, Height of shoulder (acromion):

*Hmf*, Height of middle finger from surface upon which heel rests.



CHOLO GIRLS

[p. 416 (A)]

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6
Cholo

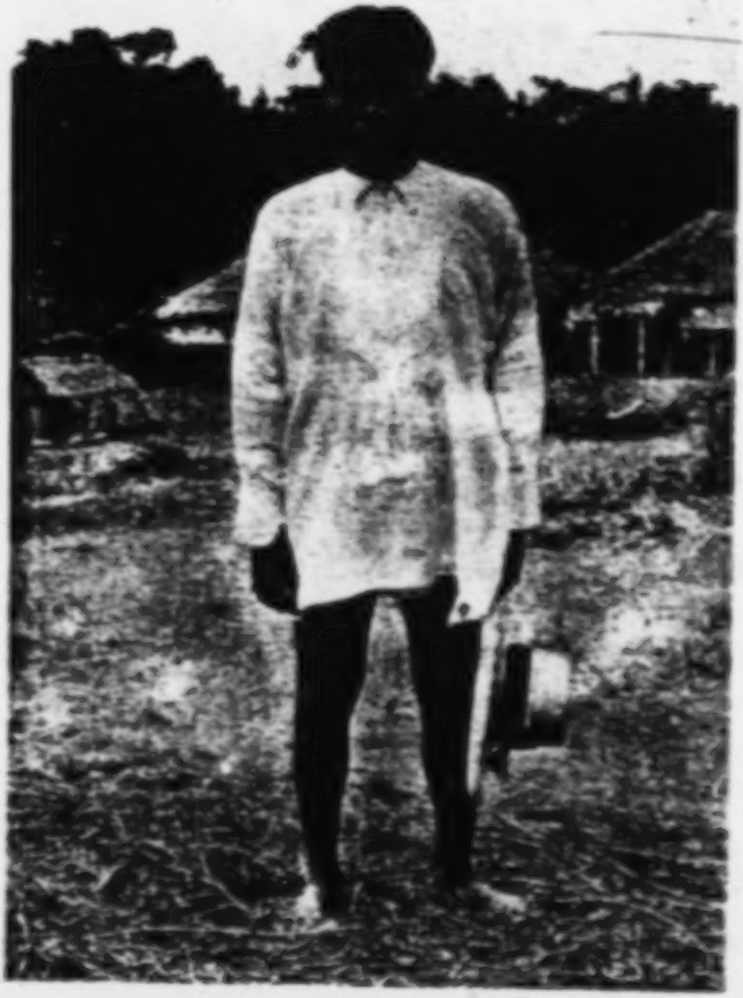
0027

3: Barrett E-5 (1908-1909)1925

SD6 Cayapa SD6

Cholo

ovv



YOUNG MAN OF THE CHOLO TRIBE

[p. 416 (B)]

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

| | |
|---|---|
| *A*, Length of arm (acromion to tip of second finger). | 141 |
| *Hs*, Height sitting. | 128 |
| *Wsh*, Width of shoulders between acromia. | |
| *Lfa*, Length of forearm (elbow to tip of middle finger). | |
| *Lh*, Length of head. | |
| *Bh*, Width of head. | |
| *Wf*, Width of face between zygomatic arches. | |
| *HfI*, Distance from hair line to chin | |
| *HfII*, Distance from nasion to chin. | |
| *Hn*, Height of nose. | |
| *Wn*, Width of nose between alæ. | |
| *IStr*, $\frac{Str}{St}$ | |
| *IA*, $\frac{A}{St}$ | |
| *IHs*, $\frac{Hs}{St}$ | |
| *IWsh*, $\frac{Wsh}{St}$ | |
| *FI*, $\frac{HfII}{Wf}$ | |
| *NI*, $\frac{Wn}{Hn}$ | |
| *CI*, $\frac{Bh}{Lh}$ | |

3: Barrett E-5 (1908-1909) 1925

SD6 Cayapa SD6

TABLE I.—TABULATION

MALES

| No. | Age | St | Sst | Sh | Head | A | Hs | Wsh | LUa | LFa | Bh | Wf | [illegible] | [illegible] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4 | 1070 | 1065 | 850 | 385 | 465 | 580 | 260 | 295 | 160 | 144 | 127 | 153 | 91 |
| 2 | 4 | 910 | 890 | 700 | 340 | 360 | 495 | 230 | 235 | 161 | 138 | 114 | 128 | 81 |
| 3 | 4 | 950 | 940 | 730 | 330 | 400 | 560 | 230 | 260 | 161 | 133 | 109 | 135 | 80 |
| 4 | 4 | 850 | 845 | 660 | 300 | 360 | 495 | 215 | 230 | 158 | 133 | 112 | 116 | 73 |
| 5 | 6 | 990 | 990 | 780 | 350 | 430 | 545 | 240 | 270 | 164 | 137 | 117 | 136 | 84 |
| 6 | 6 | 1000 | 980 | 770 | 350 | 420 | 570 | 235 | 265 | 170 | 144 | 117 | 147 | 80 |
| 7 | 7 | 1115 | 1120 | 900 | 405 | 495 | 610 | 260 | 310 | 161 | 135 | 120 | 150 | 84 |
| 8 | 7 | 1090 | 1100 | 840 | 380 | 460 | 610 | 270 | 290 | 169 | 134 | 118 | 134 | 84 |
| 9 | 7 | 1125 | 1130 | 890 | 385 | 505 | 605 | 250 | 310 | 160 | 140 | 117 | 148 | 91 |
| 10 | 8 | 1185 | 1230 | 955 | 410 | 545 | 650 | 275 | 330 | 156 | 147 | 123 | 139 | 91 |
| 11 | 10 | 1285 | 1330 | 1030 | 450 | 580 | 685 | 325 | 360 | 166 | 150 | 128 | 150 | 94 |
| 12 | 11 | 1335 | 1415 | 1080 | 440 | 640 | 705 | 345 | 370 | 164 | 146 | 126 | 164 | 102 |
| 13 | 11 | 1310 | 1310 | 1045 | 460 | 585 | 705 | 330 | 360 | 165 | 147 | 131 | 148 | 93 |
| 14 | 13 | 1430 | 1505 | 1190 | 510 | 680 | 735 | 345 | 415 | 176 | 134 | 129 | 153 | 102 |
| 15 | 14 | 1385 | 1450 | 1120 | 490 | 630 | 730 | 355 | 400 | 164 | 149 | 133 | 166 | 100 |
| 16 | 15 | 1315 | 1390 | 1070 | 455 | 615 | 705 | 315 | 370 | 160 | 139 | 122 | 148 | 93 |
| 17 | 16 | 1395 | 1390 | 1140 | 510 | 630 | 775 | 335 | 375 | 167 | 151 | 133 | 167 | 108 |
| 18 | 18 | 1560 | 1570 | 1305 | 610 | 695 | 835 | 365 | 425 | 184 | 149 | 137 | 164 | 103 |
| 19 | 18 | 1490 | 1550 | 1235 | 550 | 685 | 775 | 370 | 420 | 184 | 148 | 135 | 161 | 103 |
| 20 | 21 | 1580 | 1630 | 1320 | 580 | 740 | 855 | 420 | 435 | 191 | 155 | 143 | 168 | 106 |
| 21 | 21 | 1490 | 1555 | 1240 | 570 | 670 | 805 | 355 | 420 | 180 | 149 | 133 | 159 | 102 |
| 22 | 24 | 1530 | 1560 | 1260 | 560 | 700 | 850 | 390 | 420 | 180 | 144 | 143 | 162 | 107 |
| 23 | 28 | 1470 | 1525 | 1225 | 555 | 670 | 785 | 430 | 410 | 175 | 147 | 144 | 181 | 117 |
| 24 | 30 | 1605 | 1615 | 1340 | 625 | 715 | 865 | 395 | 435 | 180 | 151 | 147 | 172 | 109 |
| 25 | 32 | 1595 | 1705 | 1330 | 600 | 730 | 850 | 440 | 450 | 175 | 158 | 146 | 168 | 110 |
| 26 | 32 | 1570 | 1650 | 1305 | 570 | 735 | 840 | 380 | 435 | 168 | 147 | 135 | 178 | 113 |
| 27 | 34 | 1580 | 1690 | 1320 | 570 | 750 | 850 | 420 | 445 | 187 | 152 | 143 | 187 | 118 |
| 28 | 35 | 1490 | 1540 | 1250 | 560 | 690 | 810 | 360 | 415 | 170 | 136 | 133 | 175 | 111 |
| 29 | 35 | 1505 | 1550 | 1210 | 535 | 675 | 815 | 390 | 415 | 172 | 144 | 141 | 179 | 115 |
| 30 | 35 | 1605 | 1720 | 1335 | 580 | 755 | 895 | 420 | 465 | 187 | 146 | 139 | 180 | 118 |
| 31 | 35 | 1530 | 1575 | 1275 | 575 | 700 | 860 | 410 | 420 | 165 | 146 | 137 | 166 | 113 |
| 32 | 40 | 1575 | 1660 | 1315 | 575 | 740 | 830 | 395 | 430 | 178 | 143 | 135 | 177 | 122 |
| 33 | 40 | 1570 | 1610 | 1300 | 600 | 700 | 835 | 410 | 430 | 178 | 161 | 144 | 166 | 112 |

* Measurements are in millimeters.

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

OF MEASUREMENTS*

141

MALES

| Ho | Wn | IStr | IA | IHs | IWsh | FI | NI | CI | No. |
|---|---|---|---|---|---|---|---|---|---|
| 34 | 29 | 99.53 | 43.45 | 54.20 | 24.29 | 71.66 | 85.30 | 90.00 | 1 |
| 31 | 25 | 97.80 | 39.56 | 54.39 | 25.27 | 71.05 | 80.64 | 85.71 | 2 |
| 30 | 22 | 99.00 | 42.10 | 58.88 | 24.21 | 73.39 | 73.33 | 82.60 | 3 |
| 26 | 26 | 99.41 | 42.35 | 58.23 | 25.29 | 65.17 | 100.00 | 84.17 | 4 |
| 30 | 29 | 100.00 | 43.43 | 55.05 | 24.24 | 71.79 | 96.66 | 83.53 | 5 |
| 30 | 29 | 98.00 | 42.00 | 57.00 | 23.50 | 68.37 | 96.66 | 84.70 | 6 |
| 31 | 28 | 100.03 | 44.39 | 54.70 | 23.31 | 70.00 | 90.32 | 83.85 | 7 |
| 32 | 30 | 100.92 | 42.20 | 55.96 | 24.77 | 71.19 | 93.75 | 79.30 | 8 |
| 32 | 28 | 100.44 | 44.88 | 53.77 | 22.22 | 77.77 | 87.50 | 87.50 | 9 |
| 37 | 31 | 103.79 | 45.99 | 54.85 | 23.20 | 73.98 | 83.78 | 94.23 | 10 |
| 36 | 32 | 103.05 | 45.18 | 53.31 | 25.29 | 73.43 | 88.88 | 90.36 | 11 |
| 40 | 31 | 105.90 | 47 94 | 52.81 | 25.84 | 80.95 | 77.50 | 89.02 | 12 |
| 36 | 32 | 100.00 | 44.65 | 53.81 | 25.19 | 70.99 | 88.88 | 89.09 | 13 |
| 43 | 34 | 105.24 | 47.55 | 51.21 | 24.12 | 79.08 | 79.08 | 76.15 | 14 |
| 39 | 36 | 104.68 | 45.48 | 52.71 | 25.63 | 75.18 | 92.30 | 90.85 | 15 |
| 37 | 31 | 105.70 | 46.76 | 53.61 | 23.95 | 76.22 | 83.78 | 86.87 | 16 |
| 44 | 34 | 99.72 | 45.16 | 55.55 | 24.01 | 81.20 | 77.27 | 90.42 | 17 |
| 36 | 33 | 100.64 | 44.55 | 53.52 | 23.39 | 75.18 | 91.66 | 80.98 | 18 |
| 40 | 37 | 104.03 | 45.97 | 52.01 | 24.83 | 76.30 | 92.50 | 80.46 | 19 |
| 43 | 39 | 103.17 | 46.83 | 54.11 | 26.58 | 74.13 | 90.70 | 81.15 | 20 |
| 46 | 37 | 104.36 | 44.96 | 54.03 | 23.82 | 76.69 | 80.43 | 82.77 | 21 |
| 45 | 38 | 101.96 | 45.75 | 55.55 | 25.49 | 74.85 | 84.44 | 80.00 | 22 |
| 52 | 35 | 103.74 | 45.57 | 53.40 | 29.25 | 81.25 | 67.31 | 84.00 | 23 |
| 47 | 33 | 100.62 | 44.54 | 53.89 | 24.61 | 74.15 | 70.21 | 83.88 | 24 |
| 51 | 35 | 106.89 | 45.76 | 52.22 | 27.58 | 75.34 | 68.63 | 90.28 | 25 |
| 46 | 34 | 105.09 | 46.81 | 53.50 | 24.20 | 83.73 | 73.91 | 87.50 | 26 |
| 48 | 28 | 106.96 | 47.46 | 53.80 | 26.58 | 82.51 | 79.17 | 81.29 | 27 |
| 47 | 31 | 103.35 | 46.30 | 54.36 | 24.16 | 83.45 | 68.88 | 80.00 | 28 |
| 50 | 37 | 102.99 | 44.85 | 54.15 | 25.91 | 81.56 | 74.00 | 83.72 | 29 |
| 51 | 42 | 107.16 | 47.04 | 55.70 | 26.16 | 84.90 | 82.35 | 78.28 | 30 |
| 48 | 35 | 102.94 | 45.75 | 56.21 | 26.79 | 82.48 | 72.91 | 88.50 | 31 |
| 49 | 34 | 105.39 | 46.98 | 52.69 | 25.07 | 90.37 | 69.38 | 80.33 | 32 |
| 52 | 41 | 102.55 | 44.58 | 53.18 | 26.11 | 77.77 | 78.84 | 90.45 | 33 |

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

141

TABLE I.—TABULATION OF

| No. | Age | St | Str | Sh | Hmf | A | Hs | Wsh | Lfa | Lh | Bh | Wf | Hff | Hfll |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MALES | | | | | | | | | | | | | | |
| 34 | 40 | 1600 | 1660 | 1340 | 580 | 760 | 860 | 405 | 450 | 178 | 158 | 146 | 169 | 117 |
| 35 | 45 | 1560 | 1560 | 1310 | 615 | 695 | 820 | 405 | 430 | 179 | 148 | 135 | 173 | 111 |
| 36 | 48 | 1570 | 1670 | 1320 | 570 | 750 | 865 | 425 | 440 | 178 | 148 | 142 | 168 | 107 |
| FEMALES | | | | | | | | | | | | | | |
| 37 | 5 | 1045 | 1040 | 835 | 375 | 460 | 585 | 255 | 280 | 159 | 145 | 119 | 134 | 87 |
| 38 | 7 | 990 | 960 | 780 | 370 | 410 | 570 | 235 | 255 | 151 | 140 | 118 | 137 | 84 |
| 39 | 8 | 1270 | 1300 | 1050 | 460 | 590 | 660 | 300 | 360 | 171 | 140 | 124 | 144 | 85 |
| 40 | 9 | 1175 | 1180 | 930 | 415 | 515 | 640 | 280 | 315 | 167 | 144 | 123 | 145 | 93 |
| 41 | 9 | 1120 | 1120 | 895 | 420 | 475 | 625 | 265 | 295 | 158 | 139 | 120 | 143 | 88 |
| 42 | 11 | 1270 | 1280 | 1040 | 480 | 560 | 690 | 305 | 335 | 163 | 140 | 122 | 148 | 95 |
| 43 | 11 | 1120 | 1120 | 810 | 410 | 400 | 605 | 275 | 300 | 155 | 144 | 120 | 144 | 82 |
| 44 | 12 | 1250 | 1240 | 1030 | 480 | 550 | 680 | 295 | 340 | 162 | 140 | 125 | 150 | 96 |
| 45 | 12 | 1270 | 1245 | 1030 | 480 | 550 | 705 | 310 | 330 | 158 | 137 | 121 | 146 | 94 |
| 46 | 12 | 1270 | 1290 | 1030 | 460 | 570 | 660 | 290 | 340 | 163 | 142 | 123 | 152 | 96 |
| 47 | 12 | 1215 | 1255 | 975 | 430 | 545 | 650 | 285 | 330 | 160 | 141 | 122 | 140 | 92 |
| 48 | 12 | 1260 | 1280 | 1030 | 460 | 570 | 695 | 280 | 340 | 173 | 142 | 122 | 143 | 94 |
| 49 | 14 | 1390 | 1450 | 1145 | 500 | 645 | 740 | 340 | 395 | 169 | 145 | 131 | 155 | 102 |
| 50 | 20 | 1435 | 1470 | 1160 | 530 | 630 | 765 | 345 | 395 | 173 | 142 | 130 | 154 | 97 |
| 51 | 25 | 1435 | 1420 | 1180 | 560 | 620 | 780 | 350 | 370 | 162 | 146 | 131 | 159 | 98 |
| 52 | 28 | 1500 | 1515 | 1260 | 595 | 665 | 825 | 370 | 410 | 170 | 148 | 131 | 158 | 108 |
| 53 | 30 | 1510 | 1550 | 1260 | 580 | 680 | 810 | 370 | 415 | 170 | 143 | 132 | 156 | 104 |
| 54 | 30 | 1495 | 1505 | 1225 | 555 | 670 | 830 | 355 | 400 | 178 | 152 | 134 | 160 | 101 |
| 55 | 30 | 1425 | 1505 | 1180 | 510 | 670 | 760 | 335 | 390 | 172 | 151 | 133 | 164 | 105 |
| 56 | 35 | 1440 | 1470 | 1180 | 540 | 640 | 750 | 340 | 400 | 169 | 143 | 131 | 171 | 106 |
| *57* | *35* | *1535* | *1540* | *1270* | *580* | *690* | *830* | *355* | *415* | *173* | *144* | *132* | *163* | *111* |
| 58 | 35 | 1460 | 1510 | | | | 800 | | | 169 | 144 | 136 | 172 | 106 |
| 59 | 35 | 1430 | 1460 | 1180 | 530 | 650 | 790 | 370 | 400 | 164 | 151 | 129 | 168 | 112 |
| 60 | 35 | 1450 | 1515 | 1210 | 550 | 660 | 80 | 370 | 390 | 162 | 144 | 135 | 145 | 94 |
| 61 | 35 | 1405 | 1420 | 1150 | 520 | 630 | 750 | 325 | 380 | 168 | 138 | 127 | 155 | 92 |
| 62 | 38 | 1510 | 1550 | 1245 | 565 | 680 | 805 | 370 | 410 | 164 | 150 | 131 | 165 | 108 |
| 63 | 38 | 1490 | 1550 | 1230 | 550 | 680 | 795 | 365 | 410 | 170 | 150 | 128 | 159 | 105 |
| 64 | 40 | 1450 | 1455 | 1205 | 575 | 630 | 795 | 355 | 390 | 172 | 148 | 130 | 173 | 118 |

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

MEASUREMENTS—*Continued*

141

| Hn | Wn | IStr | IA | IHs | IWsh | FI | NI | CI | No. |
|---|---|---|---|---|---|---|---|---|---|
| MALES | | | | | | | | | |
| 48 | 40 | 103.75 | 47.50 | 53.75 | 25.31 | 80.13 | 83.33 | 88.76 | 34 |
| 44 | 36 | 100.00 | 44.55 | 52.56 | 25.96 | 82.22 | 81.81 | 82.68 | 35 |
| 46 | 37 | 106.37 | 47.77 | 55.09 | 27.07 | 75.35 | 80.43 | 83.15 | 36 |
| FEMALES | | | | | | | | | |
| 34 | 29 | 99.60 | 44.01 | 55.97 | 24.40 | 73.11 | 85.29 | 91.19 | 37 |
| 33 | 29 | 97.00 | 41.41 | 57.57 | 23.73 | 71.19 | 87.87 | 92.72 | 38 |
| 35 | 32 | 102.35 | 46.45 | 51.96 | 23.62 | 68.62 | 91.43 | 81.87 | 39 |
| 36 | 30 | 100.35 | 43.82 | 54.46 | 23.82 | 75.65 | 83.33 | 86.23 | 40 |
| 33 | 28 | 100.00 | 42.41 | 55.80 | 23.66 | 73.33 | 84.84 | 87.97 | 41 |
| 35 | 31 | 100.79 | 44.09 | 54.33 | 24.01 | 77.87 | 88.57 | 85.88 | 42 |
| 38 | 29 | 100.00 | 35.71 | 54.01 | 24.55 | 68.33 | 76.31 | 92.90 | 43 |
| 40 | 30 | 99.20 | 44.00 | 54.40 | 23.60 | 76.80 | 75.00 | 86.42 | 44 |
| 36 | 32 | 98.03 | 43.30 | 55.51 | 24.40 | 77.68 | 88.88 | 86.72 | 45 |
| 39 | 31 | 101.57 | 44.88 | 51.96 | 22.83 | 78.04 | 79.48 | 87.11 | 46 |
| 37 | 29 | 103.29 | 44.85 | 53.49 | 23.45 | 75.40 | 78.37 | 88.12 | 47 |
| 38 | 32 | 101.58 | 45.23 | 55.15 | 22.22 | 77.04 | 84.21 | 82.08 | 48 |
| 43 | 36 | 104.32 | 46.40 | 53.23 | 24.46 | 77.87 | 83.72 | 85.79 | 49 |
| 40 | 30 | 102.43 | 43.90 | 53.31 | 24.04 | 74.61 | 75.00 | 82.08 | 50 |
| 39 | 33 | 98.94 | 43.20 | 54.35 | 24.39 | 74.81 | 84.62 | 90.12 | 51 |
| 46 | 33 | 101.00 | 44.33 | 55.00 | 24.66 | 82.45 | 71.74 | 87.06 | 52 |
| 46 | 36 | 102.65 | 45.03 | 53.64 | 24.50 | 78.78 | 78.26 | 84.11 | 53 |
| 45 | 34 | 100.60 | 44.81 | 55.52 | 23.74 | 75.37 | 75.55 | 85.39 | 54 |
| 44 | 33 | 105.61 | 47.01 | 53.33 | 23.50 | 78.94 | 75.00 | 87.79 | 55 |
| 44 | 31 | 102.03 | 44.44 | 52.08 | 23.61 | 80.91 | 70.45 | 84.61 | 56 |
| 48 | 33 | 100.20 | 44.95 | 54.02 | 23.12 | 84.09 | 68.75 | 83.24 | 57 |
| 40 | 38 | 103.42 | | 54.79 | | 77.94 | 95.00 | 85.23 | 58 |
| 49 | 31 | 102.09 | 45.45 | 55.24 | 25.87 | 86.85 | 63.26 | 92.07 | 59 |
| 41 | 32 | 104.48 | 45.51 | 55.17 | 25.51 | 69.62 | 78.04 | 88.88 | 60 |
| 43 | 33 | 101.06 | 44.80 | 53.38 | 23.13 | 72.44 | 76.74 | 82.14 | 61 |
| 42 | 32 | 102.65 | 45.00 | 53.31 | 24.50 | 82.50 | 76.19 | 91.47 | 62 |
| 44 | 34 | 104.02 | 45.62 | 53.35 | 24.49 | 82.03 | 77.27 | 88.23 | 63 |
| 50 | 36 | 100.02 | 43.45 | 54.82 | 24.48 | 90.77 | 72.00 | 86.05 | 64 |

3: Barrett E-5 (1908-1909) 1925
SD6 Cayapa SD6

### TABLE I—TABULATION OF MEASUREMENTS —*Concluded*

141

FEMALES

| No. | Age | St | Str | Sh | Hmf | A | Hs | Wsh | Lfa | Lh | Bh | Wf | HII | HIII |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65 | 40 | 1445 | 1510 | 1200 | 530 | 670 | 790 | 340 | 400 | 158 | 137 | 125 | 165 | 108 |
| 66 | 45 | 1520 | 1545 | 1265 | 570 | 695 | 820 | 370 | 415 | 172 | 147 | 134 | 147 | 101 |
| 67 | 45 | 1440 | 1445 | 1170 | 560 | 610 | 770 | 355 | 380 | 164 | 148 | 133 | 157 | 103 |
| 68 | 50 | 1480 | 1550 | 1250 | 555 | 695 | 790 | 370 | 415 | 168 | 144 | 145 | 134 | 115 |
| 69 | 50 | 1430 | 1495 | 1160 | 505 | 655 | 775 | 385 | 400 | 173 | 143 | 135 | 155 | 100 |
| 70 | 60 | 1460 | 1490 | 1210 | 550 | 660 | 790 | 350 | 395 | 163 | 154 | 129 | 169 | 105 |

FEMALES

| Hn | Wn | IStr | IA | IHs | IWsh | FI | NI | CI | No. |
|---|---|---|---|---|---|---|---|---|---|
| 47 | 32 | 104.49 | 46.34 | 54.63 | 23.52 | 86.40 | 68.0 | 886.71 | 65 |
| 43 | 34 | 101.64 | 45.67 | 53.95 | 24.34 | 75.37 | 79.0 | 785.47 | 66 |
| 43 | 38 | 100.35 | 42.40 | 53.47 | 24.65 | 77.44 | 88.3 | 790.25 | 67 |
| 50 | 35 | 104.73 | 46.92 | 53.37 | 25.00 | 85.82 | 70.0 | 085.70 | 68 |
| 45 | 40 | 104.49 | 45.76 | 54.20 | 26.92 | 74.07 | 88.8 | 882.83 | 69 |
| 46 | 39 | 102.05 | 45.20 | 54.11 | 23.97 | 81.40 | 84.7 | 994.48 | 70 |

**3: Barrett E-5 (1908-1909)1925**
**SD 6 Cayapa SD6**

### TABLE II

### MAXIMUM, MINIMUM, AND AVERAGE MEASUREMENTS, AND INDICES OF ADULTS*

|4|

| | Males (18 + yrs. of age) Nos. 18-36 | | | Females (18 + yrs. of age) Nos. 50-70 | | |
|---|---|---|---|---|---|---|
| | *Max.* | *Min.* | *Aver.* | *Max.* | *Min.* | *Aver.* |
| St | 1605 | 1470 | 1551.31 | 1535 | 1405 | 1464.04 |
| Str | 1720 | 1525 | 1609.73 | 1550 | 1420 | 1498.57 |
| Sh | 1340 | 1210 | 1291.05 | 1265 | 1150 | 1209.50 |
| Hmf | 625 | 535 | 577.89 | 595 | 505 | 550.50 |
| A | 760 | 670 | 713.42 | 695 | 610 | 659.00 |
| Hs | 895 | 775 | 836.84 | 830 | 750 | 791.42 |
| Wsh | 440 | 355 | 399.21 | 385 | 325 | 357.25 |
| Lfa | 465 | 410 | 431.05 | 415 | 370 | 399.00 |
| Lh | 191 | 165 | 175.36 | 178 | 158 | 168.28 |
| Bh | 161 | 136 | 148.94 | 154 | 137 | 146.04 |
| Wf | 147 | 133 | 139.89 | 136 | 125 | 131.42 |
| HfI | 187 | 159 | 171.73 | 173 | 145 | 161.00 |
| HfII | 122 | 102 | 111.21 | 118 | 92 | 104.61 |
| Hn | 52 | 36 | 46.68 | 50 | 39 | 44.52 |
| Wn | 42 | 31 | 36.42 | 40 | 30 | 34.14 |
| IStr | 107.16 | 100.00 | 103.78 | 105.61 | 98.94 | 102.33 |
| IA | 47.77 | 44.54 | 45.97 | 47.01 | 42.40 | 44.98 |
| IHs | 56.21 | 52.01 | 53.88 | 55.52 | 52.08 | 54.04 |
| IWsh | 29.25 | 23.39 | 25.73 | 26.92 | 23.12 | 24.39 |
| FI | 90.37 | 74.13 | 79.59 | 90.77 | 69.62 | 79.65 |
| NI | 92.50 | 67.31 | 78.46 | 95.00 | 63.26 | 77.00 |
| CI | 90.45 | 78.28 | 83.58 | 94.48 | 82.08 | 86.85 |
| CI, Children (Nos. 1–17) | | | 86.37 | CI, Children (Nos. 37–49) | | 87.30 |

---

*Measurements are in millimeters.

[4]

TABLE III.—STATURE (St)

| Measurements (cm.) | Number of individuals | |
|---|---|---|
| | Male | Female |
| 140 | | 1 |
| 1 | | |
| 2 | | 1 |
| 3 | | 4 |
| 4 | | 2 |
| 5 | | 3 |
| 6 | | 2 |
| 7 | 1 | |
| 8 | | 1 |
| 9 | 3 | 2 |
| 150 | 1 | 1 |
| 1 | | 2 |
| 2 | | 1 |
| 3 | 2 | 1 |
| 4 | | |
| 5 | | |
| 6 | 2 | |
| 7 | 4 | |
| 8 | 2 | |
| 9 | 1 | |
| 160 | 3 | |
| No. of cases........ | 19 | 21 |
| Average........... | 155.13 | 146.40 |

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

TABLE IV.—STRETCH OF ARMS (Str)

141

| Measurements (cm.) | Number of individuals | |
|---|---|---|
| | Male | Female |
| 142 | | 2 |
| 3 | | |
| 4 | | 1 |
| 5 | | 3 |
| 6 | | 1 |
| 7 | | 2 |
| 8 | | 2 |
| 9 | | |
| 150 | | 2 |
| 1 | | 4 |
| 2 | 1 | |
| 3 | | |
| 4 | 1 | 2 |
| 5 | 3 | 2 |
| 6 | 2 | |
| 7 | 2 | |
| 8 | | |
| 9 | | |
| 160 | | |
| 1 | 2 | |
| 2 | | |
| 3 | 1 | |
| 4 | | |
| 5 | 1 | |
| 6 | 2 | |
| 7 | 1 | |
| 8 | | |
| 9 | 1 | |
| 170 | 1 | |
| 1 | | |
| 2 | 1 | |
| No. of cases........ | 19 | 21 |
| Average........... | 160.97 | 149.86 |

141 TABLE V.—HEIGHT OF SHOULDER (ACROMION) (Sh)

| Measurements (cm.) | Number of individuals | |
|---|---|---|
| | Male | Female |
| 115 | | 1 |
| 6 | | 2 |
| 7 | | 1 |
| 8 | | 4 |
| 9 | | |
| 120 | | 2 |
| 1 | 1 | 2 |
| 2 | 2 | 1 |
| 3 | 1 | 1 |
| 4 | 1 | 1 |
| 5 | 1 | 1 |
| 6 | 1 | 3 |
| 7 | 1 | 1 |
| 8 | | |
| 9 | | |
| 130 | 3 | |
| 1 | 2 | |
| 2 | 2 | |
| 3 | 2 | |
| 4 | 2 | |
| No. of cases........ | 19 | 20 |
| Average........... | 129.10 | 120.95 |

141

## TABLE VI.—HEIGHT OF MIDDLE FINGER FROM SURFACE ON WHICH HEEL RESTS (Hmf)

| Measurements (cm.) | Number of individuals | |
|---|---|---|
| | Male | Female |
| 50 | | 1 |
| 1 | | 1 |
| 2 | | 1 |
| 3 | 1 | 3 |
| 4 | | 1 |
| 5 | 2 | 5 |
| 6 | 2 | 3 |
| 7 | 6 | 2 |
| 8 | 3 | 2 |
| 9 | | 1 |
| 60 | 2 | |
| 1 | 2 | |
| 2 | 1 | |
| No. of cases | 19 | 20 |
| Average | 57.79 | 55.05 |

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

41

### TABLE VII.—LENGTH OF ARM (A)

(Acromion to Tip of Second Finger)

| Measurements (cm.) | Number of individuals | |
|---|---|---|
| | Male | Female |
| 1 | | 1 |
| 2 | | 1 |
| 3 | | 3 |
| 4 | | 1 |
| 5 | | 2 |
| 6 | | 3 |
| 7 | 3 | 3 |
| 8 | 1 | 3 |
| 9 | 3 | 3 |
| 70 | 3 | |
| 1 | 1 | |
| 2 | | |
| 3 | 2 | |
| 4 | 2 | |
| 5 | 3 | |
| 6 | 1 | |
| No. of cases.......... | 19 | 20 |
| Average............ | 71.34 | 65.90 |

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

141

TABLE VIII.—HEIGHT SITTING (Hs)

| Measurements (cm.) | Number of individuals | |
|---|---|---|
| | Male | Female |
| 75 | | 2 |
| 6 | | 2 |
| 7 | 1 | 2 |
| 8 | 1 | 1 |
| 9 | | 6 |
| 80 | 1 | 3 |
| 1 | 2 | 1 |
| 2 | 1 | 2 |
| 3 | 3 | 2 |
| 4 | 1 | |
| 5 | 4 | |
| 6 | 4 | |
| 7 | | |
| 8 | | |
| 9 | 1 | |
| No. of cases........ | 19 | 21 |
| Average............ | 83.60 | 79.14 |

191

TABLE IX.—WIDTH OF SHOULDERS BETWEEN ACROMIA (Wsh)

| Measurements (cm.) | Number of individuals | |
|---|---|---|
| | Male | Female |
| 32 | | 1 |
| 3 | | 1 |
| 4 | | 3 |
| 5 | 1 | 6 |
| 6 | 2 | 1 |
| 7 | 1 | 7 |
| 8 | 1 | 1 |
| 9 | 4 | |
| 40 | 2 | |
| 1 | 2 | |
| 2 | 4 | |
| 3 | 1 | |
| 4 | 1 | |
| No. of cases........ | 19 | 20 |
| Average............ | 39.92 | 35.72 |

NH

### TABLE X.—LENGTH OF FOREARM (1.6a)
(Elbow to tip of middle finger)

| Measurements (cm.) | Number of individuals | |
|---|---|---|
| | Male | Female |
| 37 | | 1 |
| 8 | | 2 |
| 9 | | 5 |
| 40 | | 5 |
| 1 | 3 | 7 |
| 2 | 5 | |
| 3 | 6 | |
| 4 | 2 | |
| 5 | 2 | |
| 6 | 1 | |
| No. of cases......... | 19 | 20 |
| Average............ | 43.10 | 39.90 |

3: Barrett E-5 (1908-1909)1925
SD6 Cayapa SD6

TABLE XI.—LENGTH OF HEAD—(1A)

| Measurements (mm.) | Number of individuals | |
|---|---|---|
| | Male | Female |
| 158 | | 1 |
| 9 | | |
| 160 | | |
| 1 | | |
| 2 | | 2 |
| 3 | | 1 |
| 4 | | 3 |
| 5 | 1 | |
| 6 | | |
| 7 | | |
| 8 | 1 | 2 |
| 9 | | 2 |
| 170 | 1 | 3 |
| 1 | | |
| 2 | 1 | 3 |
| 3 | | 3 |
| 4 | | |
| 5 | 2 | |
| 6 | | |
| 7 | | |
| 8 | 4 | 1 |
| 9 | 1 | |
| 180 | 3 | |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | 2 | |
| 5 | | |
| 6 | | |
| 7 | 2 | |
| 8 | | |
| 9 | | |
| 190 | | |
| 1 | 1 | |
| No. of cases | 19 | 21 |
| Average | 178.36 | 168.28 |

TABLE XII.—WIDTH OF HEAD (Bb) [9]

| Measurements (mm.) | Number of individuals | |
|---|---|---|
| | Male | Female |
| 136 | 1 | |
| 7 | | 1 |
| 8 | | 1 |
| 9 | | |
| 140 | | |
| 1 | | |
| 2 | | 1 |
| 3 | 1 | 3 |
| 4 | 2 | 4 |
| 5 | | |
| 6 | 2 | 1 |
| 7 | 2 | 1 |
| 8 | 3 | 3 |
| 9 | 2 | |
| 150 | | 2 |
| 1 | 1 | 2 |
| 2 | 1 | 1 |
| 3 | | |
| 4 | | 1 |
| 5 | 1 | |
| 6 | | |
| 7 | | |
| 8 | 2 | |
| 9 | | |
| 160 | | |
| 1 | 1 | |
| No. of cases.......... | 19 | 21 |
| Average.............. | 148.94 | 146.06 |

[46] TABLE XIII.—WIDTH OF FACE BETWEEN ZYGOMATIC ARCHES (WI)

| Measurements (mm.) | Number of individuals | |
|---|---|---|
| | Male | Female |
| 125 | | 1 |
| 6 | | |
| 7 | | 1 |
| 8 | | 1 |
| 9 | | 2 |
| 130 | | 2 |
| 1 | | 4 |
| 2 | | 2 |
| 3 | 2 | 2 |
| 4 | | 3 |
| 5 | 4 | 2 |
| 6 | | 1 |
| 7 | 2 | |
| 8 | | |
| 9 | 1 | |
| 140 | | |
| 1 | 1 | |
| 2 | 1 | |
| 3 | 3 | |
| 4 | 2 | |
| 5 | | |
| 6 | 2 | |
| 7 | 1 | |
| No. of cases | 19 | 21 |
| Average | 139.89 | 131.42 |

3: Barrett E-5 (1908-1909) 1925
SD 6 Cayapa SD6

## TABLE XIV.—DISTANCE FROM HAIR LINE TO CHIN (Hfl)

141

| Measurements (mm.) | Number of individuals | |
|---|---|---|
| | Male | Female |
| 145 | | 1 |
| 6 | | |
| 7 | | 1 |
| 8 | | |
| 9 | | |
| 150 | | |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | 1 |
| 5 | | 2 |
| 6 | | 1 |
| 7 | | 1 |
| 8 | | 1 |
| 9 | 1 | 2 |
| 160 | | 1 |
| 1 | 1 | |
| 2 | 1 | |
| 3 | | 1 |
| 4 | 1 | 1 |
| 5 | | 2 |
| 6 | 2 | 1 |
| 7 | | |
| 8 | 3 | 1 |
| 9 | 1 | 1 |
| 170 | | |
| 1 | | 1 |
| 2 | 1 | 1 |
| 3 | 1 | 1 |
| 4 | | |

TABLE XIV.—*Continued*

| Measurements (mm.) | Number of individuals | |
|---|---|---|
| | Male | Female |
| 5 | 1 | |
| 6 | | |
| 7 | 1 | |
| 8 | 1 | |
| 9 | 1 | |
| 180 | 1 | |
| 1 | 1 | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | 1 | |
| No. of cases........ | 19 | 21 |
| Average........... | 171.73 | 161.00 |

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

### TABLE XV.—DISTANCE FROM NASION TO CHIN (HfII) 141

| Measurements (mm.) | Number of individuals | |
|---|---|---|
| | Male | Female |
| 92 | | 1 |
| 3 | | |
| 4 | | 1 |
| 5 | | |
| 6 | | |
| 7 | | 1 |
| 8 | | 1 |
| 9 | | |
| 100 | | 1 |
| 1 | | 2 |
| 2 | 1 | |
| 3 | 2 | 1 |
| 4 | | 1 |
| 5 | | 3 |
| 6 | 1 | 2 |
| 7 | 2 | |
| 8 | | 3 |
| 9 | 1 | |
| 110 | 1 | |
| 1 | 2 | 1 |
| 2 | 1 | 1 |
| 3 | 2 | |
| 4 | | |
| 5 | 1 | 1 |
| 6 | | |
| 7 | 2 | |
| 8 | 2 | 1 |
| 9 | | |
| 120 | | |
| 1 | | |
| 2 | 1 | |
| No. of cases......... | 19 | 21 |
| Average............ | 111.21 | 104.61 |

### TABLE XVI.— HEIGHT OF NOSE (Hn)

| Measurements (mm.) | Number of individuals | |
|---|---|---|
| | Male | Female |
| 36 | 1 | |
| 7 | | |
| 8 | | |
| 9 | | 1 |
| 40 | 1 | 2 |
| 1 | | 1 |
| 2 | | 1 |
| 3 | 1 | 3 |
| 4 | 1 | 3 |
| 5 | 2 | 2 |
| 6 | 3 | 3 |
| 7 | 1 | 1 |
| 8 | 3 | 1 |
| 9 | 1 | 1 |
| 50 | 1 | 2 |
| 1 | 2 | |
| 2 | 2 | |
| No. of cases......... | 19 | 21 |
| Average............ | 46.68 | 44.52 |

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

TABLE XVII.—WIDTH OF NOSE BETWEEN ALÆ (Wn)

| Measurements (mm.) | Number of individuals | |
|---|---|---|
| | Male | Female |
| 30 | | 1 |
| 1 | 1 | 2 |
| 2 | | 3 |
| 3 | 2 | 5 |
| 4 | 2 | 3 |
| 5 | 3 | 1 |
| 6 | 1 | 2 |
| 7 | 4 | |
| 8 | 2 | 2 |
| 9 | 1 | 1 |
| 40 | 1 | 1 |
| 1 | 1 | |
| 2 | 1 | |
| No. of cases........ | 19 | 21 |
| Average............ | 36.42 | 34.14 |

TABLE XVIII.—(IStr)

| Index | Number of individuals | | | |
|---|---|---|---|---|
| | Men | Boys | Women | Girls |
| 97 | | | | 1 |
| 8 | | 1 | | 1 |
| 9 | | 3 | 1 | 1 |
| 100 | 1 | 6 | 3 | 4 |
| 1 | 2 | 1 | 3 | 1 |
| 2 | 1 | | 5 | 3 |
| 3 | 5 | 1 | 3 | 1 |
| 4 | 4 | 1 | 4 | 1 |
| 5 | 2 | 2 | 1 | |
| 6 | 1 | 2 | 1 | |
| 7 | 3 | | | |
| No. of cases.............. | 19 | 17 | 21 | 13 |
| Average.................. | 103.79 | 101.37 | 102.33 | 100.62 |
| Average (Nos. 5-17)....... | | 102.11 | | |

141

TABLE XIX.—(IHs)

| Index | Number of individuals | | | |
|---|---|---|---|---|
| | Men | Boys | Women | Girls |
| 51 | | 1 | | |
| 2 | 2 | | 1 | 2 |
| 3 | 5 | 3 | 7 | 3 |
| 4 | 8 | 5 | 6 | 3 |
| 5 | 1 | 4 | 6 | 2 |
| 6 | 3 | 1 | 1 | 2 |
| 7 | | 1 | | 1 |
| 8 | | 1 | | |
| 9 | | 1 | | |
| No. of cases | 19 | 17 | 21 | 13 |
| Average | 53.88 | 54.71 | 54.04 | 54.46 |
| Average (Nos. 5–17) | | 54.18 | | |

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

### TABLE XX—(IWsh)

| Index | Number of individuals | | | |
|---|---|---|---|---|
| | Men | Boys | Women | Girls |
| 22 | | 1 | | |
| 3 | 1 | 4 | 4 | 1 |
| 4 | 3 | 5 | 10 | 2 |
| 5 | 5 | 5 | 3 | 9 |
| 6 | 4 | 2 | 2 | 1 |
| 7 | 4 | | 1 | |
| 8 | 1 | | | |
| 9 | 1 | | | |
| No. of cases.............. | 19 | 17 | 20 | 13 |
| Average.................. | 25.73 | 23.78 | 24.39 | 23.59 |
| Average (Nos. 5–17)...... | | 24.25 | | |

### TABLE XXI.—(Ia)

| Index | Number of individuals | | | |
|---|---|---|---|---|
| | Men | Boys | Women | Girls |
| 36 | | | | 1 |
| 7 | | | | |
| 8 | | | | |
| 9 | | 1 | | |
| 40 | | | | |
| 1 | | | | 1 |
| 2 | | 4 | 1 | |
| 3 | | 2 | 2 | 2 |
| 4 | | 1 | 3 | 4 |
| 5 | 6 | 5 | 7 | 3 |
| 6 | 6 | 1 | 5 | 2 |
| 7 | 6 | 1 | 2 | |
| 8 | 1 | 2 | | |
| No. of cases.............. | 19 | 17 | 20 | 13 |
| Average.................. | 45.97 | 44.29 | 44.98 | 43.58 |
| Average (Nos. 5–17)...... | | 45.04 | | |

**3: Barrett E-5 (1908-1909)1925**
**SD6 Cayapa SD6**

141

## TABLE XXII.—FACIAL INDEX (FI)

| Index | Number of individuals | | | |
|---|---|---|---|---|
| | Men | Boys | Women | Girls |
| 65 | | 1 | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | 1 | | 1 |
| 9 | | | | 1 |
| 70 | | 1 | 1 | |
| 1 | | 3 | 1 | 1 |
| 2 | | 2 | | |
| 3 | | 2 | | 2 |
| 4 | 2 | 1 | 1 | |
| 5 | 4 | 1 | 4 | 1 |
| 6 | 1 | 1 | | 1 |
| 7 | 1 | | 1 | 2 |
| 8 | 1 | 1 | 1 | |
| 9 | | 1 | 2 | |
| 80 | 1 | | | |
| 1 | 1 | 2 | 2 | |
| 2 | 3 | | 2 | |
| 3 | 1 | | 1 | |
| 4 | 2 | | 1 | |
| 5 | 1 | | | |
| 6 | | | 2 | |
| 7 | | | 1 | |
| 8 | | | | |
| 9 | | | | |
| 90 | 1 | | | |
| 1 | | | 1 | |
| No. of cases.............. | 19 | 17 | 21 | 13 |
| Average.................. | 79.99 | 73.61 | 79.65 | 74.69 |
| Average (Nos. 5–17)...... | | 74.63 | | |

**3: Barrett E-5 (1908-1909)1925**
**SD 6 Cayapa SD6**

### TABLE XXIII.—NASAL INDEX (NI)

14

| Index | Number of individuals | | | |
|---|---|---|---|---|
| | Men | Boys | Women | Girls |
| 63 | | | 1 | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | 1 | | | |
| 8 | | | 1 | |
| 9 | 3 | | 1 | |
| 70 | 1 | | 2 | |
| 1 | | | | |
| 2 | | | 2 | |
| 3 | 1 | 1 | | |
| 4 | 2 | | | |
| 5 | | | 2 | 1 |
| 6 | | | 2 | 1 |
| 7 | | 2 | 2 | |
| 8 | | | 2 | 1 |
| 9 | 2 | 1 | 1 | 1 |
| 80 | 2 | | | |
| 1 | | 1 | | |
| 2 | 2 | | | |
| 3 | 1 | | | 1 |
| 4 | 1 | 2 | | 2 |
| 5 | | 1 | 2 | 2 |
| 6 | | | | |
| 7 | | 1 | | |
| 8 | | | 1 | 2 |
| 9 | | 2 | 1 | 1 |
| 90 | | 1 | | |
| 1 | 1 | | | 1 |

**3: Barrett E-5 (1908-1909)1925**

**SD6 Cayapa SD6**

|4|

TABLE XXIII.—*Continued*

| Index | Number of individuals | | | |
|---|---|---|---|---|
| | Men | Boys | Women | Girls |
| 2 | 2 | 1 | | |
| 3 | | | | |
| 4 | | 1 | | |
| 5 | | | 1 | |
| 6 | | | | |
| 7 | | 2 | | |
| 8 | | | | |
| 9 | | | | |
| 100 | | 1 | | |
| No. of cases | 19 | 17 | 21 | 13 |
| Average | 78.46 | 86.90 | 77.00 | 83.64 |
| Average (Nos. 5-17) | | 87.41 | | |

TABLE XXIV.—CEPHALIC INDEX (CI)

| Index | Number of individuals | | | |
|---|---|---|---|---|
| | Men | Boys | Women | Girls |
| 76 | | 1 | | |
| .5 | | | | |
| 7 | | | | |
| .5 | | | | |
| 8 | | | | |
| .5 | | | | |
| 9 | | | | |
| .5 | | 1 | | |
| 80 | 2 | | | |
| .5 | 2 | | | |

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

TABLE XXIV.—*Continued* M1

| Index | Number of individuals | | | |
|---|---|---|---|---|
| | Men | Boys | Women | Girls |
| 1 | 2 | | | |
| .5 | 1 | | | |
| 2 | | | 2 | 2 |
| .5 | 2 | 1 | | |
| 3 | 1 | | 2 | |
| .5 | 1 | 1 | | |
| 4 | 2 | 2 | 1 | |
| .5 | | 1 | 1 | |
| 5 | | | 1 | |
| .5 | | 1 | 3 | |
| 6 | | | 1 | 3 |
| .5 | | | | 1 |
| 7 | | 1 | 1 | 2 |
| .5 | 1 | 1 | 1 | |
| 8 | | | 2 | 2 |
| .5 | 2 | | | |
| 9 | 1 | 2 | 1 | |
| .5 | | | | |
| 90 | | 1 | 2 | |
| .5 | 2 | 2 | | |
| 1 | | 1 | | 1 |
| .5 | | | 1 | |
| 2 | | | 1 | |
| .5 | | | | |
| 3 | | | | 2 |
| .5 | | | | |
| 4 | | 1 | | |
| .5 | | | 1 | |
| No. of cases ...... | 19 | 17 | 21 | 13 |
| Average ...... | 83.58 | 86.37 | 86.85 | 87.30 |
| Average (Nos. 5-17) ...... | | 86.04 | | |
| No. Mesocephalic ...... | 10 | 3 | 4 | 2 |
| No. Brachycephalic ...... | 9 | 14 | 17 | 11 |

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

[4]

## TABLE XXV.—TABLE OF RELATIONSHIPS

f = father
m = mother
so = son
d = daughter
br = brother
si = sister
g f = grandfather
g m = grandmother
g so = grandson
g d = granddaughter
h = husband
w = wife

1 = so of 34, 57; br of 13, 14, 44, 49.
2 = so of 23, 52; br of 37.
3 = so of 36, 66; br of 20, 39.
4 = (name, Sapo)
5 = br of 9, 43.
6 = (name, Yukito)
7 = so of 35, 56.
8 = so of 30, 60.
9 = so of 29, 61; br of 5, 43.
10 = so of 33, 63; br of 19, 21. (name, Pablo)
11 = so of 62; g so of 68; br of 15; h of 55.
12 = so of 59.
13 = so of 34, 57; br of 1, 14, 44, 49.
14 = so of 34, 57; br of 1, 13, 44, 49.
15 = so of 62; g so of 68; br of 11.
16 = so of 32, 65; br of 47.
17 = so of 67; br of 31, 45. (name, Jenaro)
18 = (name, Pipa)
19 = so of 33, 63; br of 10, 21. (name, Bellisario)
20 = so of 36, 66; br of 3, 39.
21 = so of 33, 63; br of 10, 19; h of 50. (name, Juan)
22 = h of 51. (name, Pehla'sa)
23 = f of 2, 37; h of 52. (name, Piwañtcitcios Barfiki)
24 = so of 68; br of 62, 59; f of 40. (name, Juan Vicente)
25 = h of 53. (name, José Lisandro)
26 = br of 46. (name, Antonio Tamonero)
27 = h of 58.
28 = br of 29.
29 = h of 61; f of 9, 43; br of 28. (name, Chibu)
30 = f of 8; h of 60. (name, Antonio Nyapa)
31 = so of 67; br of 17, 45; f of 42, 48. (name, Ramón Pichota)

TABLE XXV.—*Continued* |4|

32 = h of 65; f of 16, 47.
33 = h of 63; f of 10, 19, 21. (name, José Trejo)
34 = h of 57; f of 1, 13, 14, 44, 49. (name, Rosendo)
35 = f of 7; h of 56. (name, Sylvester)
36 = h of 66; f of 3, 20, 39. (name, Manuel Sanfiki)
37 = d of 23, 52; si of 2.
38 = si of 41.
39 = d of 36, 66; si of 20, 3.
40 = d of 24; g d of 68.
41 = si of 38.
42 = d of 31; si of 48.
43 = d of 29, 61; si of 5, 9.
44 = d of 34, 57; si of 1, 13, 14, 49.
45 = d of 67; si of 31, 17.
46 = si of 26.
47 = d of 65, 32; si of 16.
48 = d of 31; si of 42.
49 = d of 34, 57; si of 1, 13, 14, 44.
50 = w of 21.
51 = w of 22.
52 = w of 23; m of 2, 37
53 = w of 25.
55 = w of 11.
56 = w of 35; m of 7.
57 = w of 34; m of 1, 13, 14, 44, 49.
58 = w of 27.
59 = m of 12; si of 24.
60 = w of 30; m of 8.
61 = w of 29; m of 9, 43.
62 = w of 68; m of 11, 15; si of 24.
63 = w of 33; m of 10, 19, 21.
65 = w of 32; m of 47, 16.
66 = w of 36; m of 3, 20, 39.
67 = m of 17, 31, 45. (name, Maria)
68 = m of 24, 62; g m of 11, 15, 40.

## NUMERAL SYSTEM

802 The notes on and analysis of Cayapa numerals here given were made the subject of a short contribution to the *Putnam Anniversary Volume*, 1909, in which they appear under the title of "The Cayapa Numeral System." They are based on the accompanying table of numbers, which runs to 10,000. Only one informant could carry the count above a few thousands; but there seems no doubt that the higher thousands here given are correct.

The Cayapa numeral system is a quinary-decimal-centenary one with certain variations, to be noted later, and the rules on which it is based are well fixed and regular. In it there are certain points of special interest. One of these is its centenary nature, according to which there is no separate term for thousand; but hundred is used as the base of all numbers from 100 up, thus making a number like 4000 forty hundreds, not four thousands.

Also, there appear two terms which show what may be regarded as traces of other systems, though on account of the lack of other terms in support of these systems, they must be treated as only possibilities. Four is formed on the base two, thus showing what may be a trace of a binary system; but this is the only evidence of such a system found in the whole series of numbers. Especially significant in considering this term is the fact that three exists independently of two, and thus points strongly to a system higher than the binary. The second extraneous term is twenty, which appears entirely unrelated to any of the other numbers, either lower or higher. This might be taken as a trace of a system of

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

vigesimal nature, but it lacks even so much support as four, and the binary system for it has not even one other number of a form in any way resembling it. On the other hand, though two other terms of the system are held in common with a neighboring language, the terms for four and twenty do not show this indication of possible borrowing either by one people or the other. [illegible]

An unusual feature here shown is the use of two distinct terms for the same number in two different parts of the system. This occurs in ten, where *pa'ii'a* is used up to nineteen; and *tsá'ēpa*, apparently a borrowed term, from thirty up.

The order given to the figures of the various denominations is as follows:

All compound numbers from ten up which contain a figure of the units order have this as the final term. Thus thirteen is ten three. The numbers six to nine are compounds of five with the four lower numbers. Here the same rule is followed and the numbers one to four are terminal.

In all tens and in all hundreds, which in this system include the thousands also, the term tens or hundreds is the final one, being preceded by the number of tens or hundreds in the numeral in question. Thus 40 is four tens, 400 is four hundreds, and 4000 is forty hundreds.

In no case is there found anything in the nature of a connective term between the parts of a compound number.

Following the phonetic laws of the language, certain terms, if not used as the ultimate ones, are changed when they occur in a compound numeral. Thus *pé'ma* soc [illegible]

802 144 is the unit three, and *pa'ii'a pẽma* is thirteen, but *pē'ñ tcáñga* is thirty. So far as two and three are concerned, the change is regular and universal. One changes in the hundreds place in the numerals one hundred to one hundred ninety-nine, and in six when this occurs as a terminal figure. Five has three forms. According to these phonetic laws also, these numbers, when occurring in units or in the units place, undergo the same changes if followed by other terms possessing the necessary sounds. Thus, in the sentence "he has three new ollas," *ya-tcï kasa pē'n pĭa'ma kŭⁿ*, literally "his new three ollas has," the change of form of the numeral is necessary. Equally correct, however, is *ya-tcï kasa pua'ma pẽma kŭⁿ*, in which the surrounding sounds do not necessitate the change. It appears also that the numbers two and three, and perhaps one and five, may exert an influence upon the term following, as in the cases of *pa'i patsa* and *pē'ñ kasa*, in which the change of the second term would seem to be related to the preceding sounds.

### *Rules of Composition*

The numbers on which the Cayapa numeral system is based are 1, 2, 3, 5, 10, 20, and 100. On these the composition proceeds as follows:

Four is *ta*-2.

Six to nine are 5-*ãic* 1, 2, 3, and 4 respectively.

Ten alone and as a component of the numbers 11 to 19 and other higher numbers in which these occur is *pa'ii'a*, a term quite different from tens (*tcá'ñga*) used

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

in the composition of the tens from 30 up and in all higher numbers in which these occur. 30

Beginning with 11 all units proceed regularly by the simple addition of the unit terms 1 to 9 to the particular ten under consideration.

Twenty has a name which, unlike the other tens, is not related in any way to the units.

Beginning with 30 all the tens proceed regularly by the addition of *tcä'ñga* to the unit terms 3 to 9, with certain changes in some of these terms, as elsewhere noted.

Hundred is the last grand division, and all the higher numbers are simply the term hundred preceded by the term indicating the number of hundreds in the particular numeral.

### *Basal Numbers*

One occurs as a basal number in the following: In 1 where it is rendered *ma'iñ*; in 6, where it is rendered *ma'lyö*; and in 100, where it is rendered *mam*, and in all higher numbers containing one of these in composition. In the accompanying table of numerals these three forms occur in the following numbers:

*ma'iñ* occurs in 1, 11, 21, 60, 101, 600, 1100, 1600, 2100, and 6000[*]
*ma'lyö* occurs in 6 and 16
*mam* occurs in 100, 101, 110, 120, and 10000.

Two occurs as a basal number in the following: in 2, 4, 7, and 9, in all of which it is rendered *pa'lyö*. It is

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[*] While 1 in the composite number 6 is rendered *ma'lyö*, this is true only where 6 is the terminal figure in the higher composite numbers. In all other cases it is rendered *ma'iñ*.

30. also rendered *pa'lyö*, if in the units place, in all higher numbers in which any of these four occur. If, however, they appear in the tens or a higher column, 2 becomes *pai*, as is the case in ordinary sentence structure; for instance, *pai kü'tca*, two dogs. An exception appears in 20 and 2000, since 20 is rendered by a term, *ma'n-tcalöra*, entirely unrelated to any of the other numbers and also since the system proceeds strictly on a centenary basis from 100 up.

In the accompanying table these two forms occur as follows:

*pa'lyö* occurs in 2, 4, 7, 9, 12, 14, 17, and 19.
*pai* occurs in 40, 70, 90, 200, 400, 700, 900, 1200, 1400, 1700, 1900, 2200, 4000, 7000, and 9000.

Three occurs as a basal number in 3 and 8, in both of which it is rendered *pi'ma*, and in all higher numbers which contain either of these. In all cases in which either occurs in the units column it retains its original unit form given above. Wherever it occurs in the tens or in a higher column its form is changed to *piä*, here again following the ordinary phonetic rules. These two forms are here found in the following numbers:

*pi'ma* in 3, 8, 13, and 18.
*piä* in 30, 80, 300, 800, 1300, 1800, 3000, and 8000.

Five is used as a basal number as follows: in 5, where it is rendered *ma'n-da*, and 6, 7, 8, and 9, in all of which it is rendered *ma'n-dic*, and in all higher numbers in which these occur. In the higher numbers where 5 appears in any of the columns from the tens up, its

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SD 6 Cayapa SD6

form is *maá*. Though 5 appears in the units as *ma'n-da*, it would seem, when its other forms are considered, that this is really a compound and that its simplest form is *mane* or *maá*. As with the lower numbers, in all cases in which 5 appears in the units column, it retains its unit form, but in all other cases it is changed. Since the system is in part of quinary one, 6 begins the second set or group, and 6, 7, 8, and 9 are compound of 5, with 1, 2, 3, and 4, respectively, added. In these the term 5 takes the form *ma'n-dic*, probably *ma'n-da-ic* in full. In this form it occurs in all the higher numbers in which 6, 7, 8, and 9 appear. As above stated, in any of the higher numbers in which 5 itself appears in any of the columns above the units, it has the form *maá*, which is the same rendition that it has in a sentence when followed by such a term as *ya* or *bű'ca*, as *ma'á ya*, five houses, or *ma'á bűtsa*, five dogs. In the list of numerals the three forms occur as follows: 802.

*ma'n-da* occurs in 5 and 15.
*ma'n-dic* occurs in 6, 7, 8, 9, 16, 17, 18, 19, 60, 70, 80, 90, 600, 700, 800, 900, 1600, 1700, 1800, 1900, 6000, 7000, 8000, and 9000.
*maá* occurs in 50, 500, 1500, and 5000.

Ten occurs as a basal number as follows: in the numbers 10 to 19, inclusive, where it is rendered *pa'ü'a*, and in the higher numbers in which any one of these appears. This term ten is quite a different one from tens, *ka'ñpa*, which is used in the numbers from 30 up. This unusual use of a term for tens which is entirely distinct from the simple 10 appears to be explainable through borrowing, since in a neighboring 502
:77

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SD6 Cayapa SD6

902 language, the Quichua,* both 10 and tens are rendered tcu'nga, though the cause of such borrowing, if such it is, remains uncertain. These two terms appear in the accompanying list as follows:

*pa'it a* appears in 10 to 19 inclusive, and in 1000 to 1900 inclusive.

*tcu'nga* appears in 20 to 90 inclusive, and in 2000 to 9000 inclusive.

Twenty, *ma'ntcaiñu*, one of the two exceptions to the regularity of this numeral system, appears as a basal number in 20 and in all higher numbers in which it, as such, occurs. In the accompanying list

*ma'ntcaiñu* appears in 20, 21, 120, 2000, 2100, and 2200.

Hundred, *pa'tsa* or *ba'tsa*, depending on its phonetic surroundings, forms the base of all numbers from 100 up. This includes the thousands also, since the system is centenary above 100. Thus, 8000 is not eight thousands but eighty hundreds.

[195] * There is in Cayapa no nominal plural, hence *tcu'nga* and *ba'tsa* are both singular and plural so far as form is concerned. The former, not being the term used for 10, is really used only in a plural sense, but the latter is used as both singular and plural. Further, the term *tcu'nga* is, according to a short Quichua vocabulary obtained from a couple of informants temporarily on the Rio Cayapas, the regular term ten in that language and is used throughout their entire system. The term hundred has also a close parallel, *pa'tcak*, in Quichua, but, while Cayapa has a strict centenary system above 100, Quichua carries the hundreds only as far as 1000, which is *uara'nga*, a term entirely unrelated to hundred.

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

*pa'lna* or *ba'lna* appears here in 100, 101, 110, 120, 200 to 2200 inclusive and 3000 to 10000 inclusive. 802

| | Cayapa Numerals | Analysis |
|---|---|---|
| 1 | *maió* | 1* |
| 2 | *pa'lyó* | 2 |
| 3 | *pí'ma* | 3 |
| 4 | *ta'l-palyó* | *tal*-2 |
| 5 | *ma'n-da* | 5-*da* |
| 6 | *man-dic ma'lyó* | 5-*dic* 1 |
| 7 | *man-dic pa'lyó* | 5-*dic* 2 |
| 8 | *man-dic pí'ma* | 5-*dic* 3 |
| 9 | *man-dic ta'l-palyó* | 5-*dic* *tal*-2 |
| 10 | *pa'tí'a* | 10 |
| 11 | *pa'tí'a ma'ió* | 10 1 |
| 12 | *pa'tí'a pa'lyó* | 10 2 |
| 13 | *pa'tí'a pí'ma* | 10 3 |
| 14 | *pa'tí'a ta'l-palyó* | 10 *tal*-2 |
| 15 | *pa'tí'a ma'n-da* | 10 5-*da* |
| 16 | *pa'tí'a ma'n-dic malyó* | 10 5-*dic* 1 |
| 17 | *pa'tí'a ma'n-dic palyó* | 10 5-*dic* 2 |
| 18 | *pa'tí'a ma'n-dic píma* | 10 5-*dic* 3 |
| 19 | *pa'tí'a man-dic ta'l-palyó* | 10 5-*dic* *tal*-2 |
| 20 | *ma'mitaléra* | 20 |
| 21 | *ma'mitaléra ma'ió* | 20 1 |
| 30 | *pí'ó kiú'nga* | 3 tens [See pp. 453-54] |
| 40 | *ta'l-pai kiúnga* | *tal*-2 tens |
| 50 | *ma'ó kiúnga* | 5 tens |
| 60 | *man-dic ma'ió kiúnga* | 5-*dic* 1 ten |
| 70 | *man-dic pa'i kiúnga* | 5-*dic* 2 tens |
| 80 | *man-dic pí'ó kiúnga* | 5-*dic* 3 tens |
| 90 | *man-dic ta'l-pai kiúnga* | 5-*dic* *tal*-2 tens |
| 100 | *man ba'lna* | 1 hundred |
| 101 | *man balna ma'ió* | 1 hundred 1 |
| 110 | *man balna pa'tí'a* | 1 hundred 10 |
| 120 | *man balna ma'mitaléra* | 1 hundred 20 |

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* So far all efforts to reduce these terms to tangible objects such as are often used by primitive peoples in counting have not met with success.

3: Barrett E-5 (1908-1909) 1925
SD 6 Cayapa SD6

802

| | Cayapa Numerals | Analysis |
|---|---|---|
| 200 | *pai pa'tsa* | 2 hundreds |
| 300 | *pēñ ba'tsa* | 3 hundreds |
| 400 | *tal-pai pa'tsa* | *tal*-2 hundreds |
| 500 | *mañba'tsa* | 5 hundreds |
| 600 | *man-dic ma'iñ batsa* | 5-*dic* 1 hundreds |
| 700 | *man-dic pa'i patsa* | 5-*dic* 2 hundreds |
| 800 | *man-dic pē'ñ batsa* | 5-*dic* 3 hundreds |
| 900 | *man-dic ta'l-pai patsa* | 5-*dic* tal-2 hundreds |
| 1000 | *pa'iṭ·a patsa* | 10 hundreds |
| 1100 | *pa'iṭ·a ma'iñ batsa* | 10 1 hundreds |
| 1200 | *pa'iṭ·a pa'i patsa* | 10 2 hundreds |
| 1300 | *pa'iṭ·a pē'ñ batsa* | 10 3 hundreds |
| 1400 | *pa'iṭ·a ta'l-pai patsa* | 10 *tal*-2 hundreds |
| 1500 | *pa'iṭ·a ma'ñ batsa* | 10 5 hundreds |
| 1600 | *pa'iṭ·a man-dic ma'iñ batsa* | 10 5-*dic* 1 hundreds |
| 1700 | *pa'iṭ·a man-dic pa'i patsa* | 10 5-*dic* 2 hundreds |
| 1800 | *pa'iṭ·a man-dic pē'ñ batsa* | 10 5-*dic* 3 hundreds |
| 1900 | *pa'iṭ·a man-dic ta'l-pai patsa* | 10 5-*dic* *tal*-2 hundreds |
| 2000 | *ma'ntcalōra patsa* | 20 hundreds |
| 2100 | *mantcalōra ma'iñ batsa* | 20 1 hundreds |
| 2200 | *mantcalōra pa'i patsa* | 20 2 hundreds |
| 3000 | *pē'ñ tcūñga patsa* | 3 tens hundreds |
| 4000 | *ta'l-pai tcūñga patsa* | *tal*-2 tens hundreds |
| 5000 | *ma'ñ tcūñga patsa* | 5 tens hundreds |
| 6000 | *man-dic ma'iñ tcuñga patsa* | 5-*dic* 1 tens hundreds |
| 7000 | *man-dic pa'i tcūñga patsa* | 5-*dic* 2 tens hundreds |
| 8000 | *man-dic pē'ñ tcūñga patsa* | 5-*dic* 3 tens hundreds |
| 9000 | *man-dic ta'l-pai tcūñga patsa* | 5-*dic* *tal*-2 tens hundreds |
| 10000 | *ma'm batsa patsa* | 1 hundred hundreds |

## A SYSTEM OF MNEMONIC WRITING

802
176
211
[177]

As has already been noted, the Cayapa have no written language and express nothing in writing of any kind. An interesting example of the power of adaptation, however, was given by one individual along this line. The incident, while it has no direct bearing on the general life and culture of the tribe as a whole, may perhaps be significant and of interest when the general subject of mnemonics and hieroglyphic writing is considered, for it shows how readily a single individual of a tribe may borrow a principle which is entirely foreign to the culture of his own people and, with this as a basis, may invent a new system which might give rise to an entirely new order of things if it were carried to its full possibilities. Furthermore, this system is of considerable interest from a phonetic point of view, since it shows that it is founded on strictly phonetic considerations and thus shows what may be termed the natural tendency of the mind of man to correlate and arrange at least some linguistic ideas along logical, phonetic lines.

On the arrival of the author in the Cayapa country he took up his residence with a prominent official of the tribe known, according to the present-day Spanish terminology, as "El Secretario del Gobernacion." When the author expressed a desire to learn the Cayapa language, his host manifested an equal desire to learn English. It was therefore mutually agreed that each should instruct the other. A beginning was made with the numeral system, the author being given the names of the Cayapa numerals. As the terms were pronounced,

902
176
211

careful record of them was made in writing. However, when the Secretario was told the English numerals, he was entirely dependent on his memory, since no system of writing was known to him. On the following day, when each endeavored to recite his lesson to the other, the Secretario was greatly surprised to hear the author read from his notes and correctly pronounce the Cayapa numerals told him the day before, whereas he, on the other hand, had much difficulty in getting his pronunciation correct and in remembering certain of the English numerals. He asked the author how it was possible to remember these numbers and the pronunciation of them; and upon being told about the aid to the memory given by the writing, he was immediately desirous of trying such a plan himself. Being provided with pencil and paper, he thereupon carefully recorded the first ten of the accompanying set of mnemonic characters (fig. 29). With this paper before him he was able, on the following day, to the author's surprise, to recount with almost perfect exactness these first ten English numerals. A day or two more added another set, and in the course of about a week he had worked out a complete system of mnemonic characters for the numerals from one to one hundred. Furthermore, an interesting feature of this set of mnemonic characters is the fact that they are strictly decimal in their composition, whereas the Cayapa numerals form a much more complex system, it being quinary-decimal-centenary.

The units themselves appear to be entirely unrelated one to another, and as the author watched the Indian making these characters it was evident that a pure process of invention was evolving in his mind, his chief desire being in each instance to get some character that

802
176
211

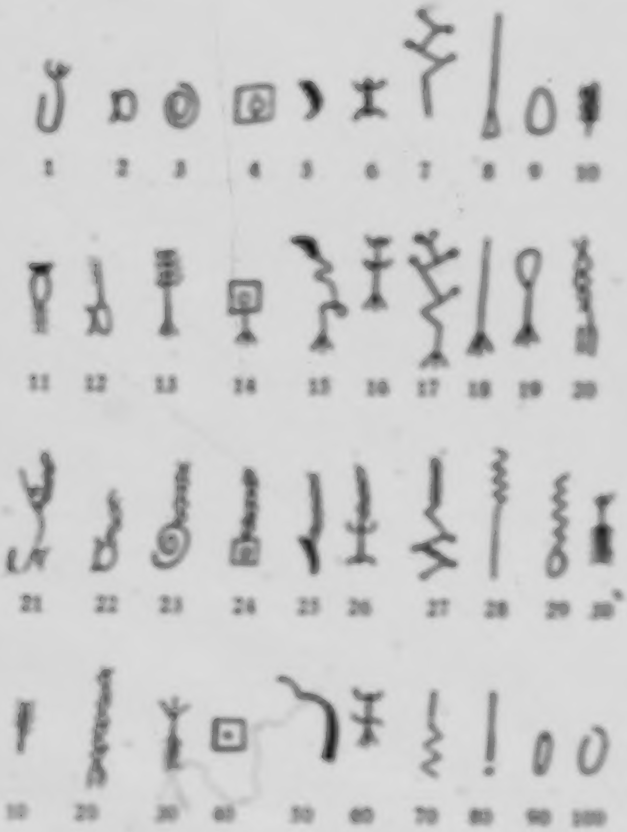
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Fig. 29.—Mnemonic characters

should represent the particular number and which should be different from all the others.

In forming most of the characters to represent the

802 numbers from eleven to nineteen he took carefully into 176 account those representing the units one to nine. In 211 fact, he always referred to these and in most cases reproduced them entirely, or in part, as portions of the characters representing the 'teens. Indeed the characters representing fourteen to nineteen are clearly and obviously these same unit characters with the addition of the crowfoot beneath, which represented to his mind the idea of 'teen—not that it was related to ten, but the crowfoot actually represented to him the sounds comprising 'teen. It is even more evident in thirteen, where the crowfoot first appears but where the unit character for three is not present, that the various parts of these characters actually represented to his mind sounds, rather than precisely correlated ideas of the numeral system. This became clear whenever he used this table of characters, for when he first repeated these numbers he did so very slowly and pointed to the particular part of the character which represented the sound which he was speaking. For instance, in the case of fourteen he would point to the square enclosing the circle and say "four;" then his pencil would go down to the crowfoot and he would say "teen." Likewise in nineteen the oval was nine and the crowfoot 'teen. As still further evidence of the phonetic nature of these mnemonic characters, eleven and twelve are excellent examples. To our minds eleven and twelve belong logically to the set of 'teens, though "'teen" does not appear in them. To the Cayapa's mind, however, the vertical line with the four dots on each side in the sign for eleven represented "e," and the oval with its heavy crescent above

302
176
211

represented "leven." Likewise, in the case of twelve, the oval with the crescent on the side represented "two," and the vertical line with the four dots on the left represented "helve." Furthermore, he learned this number not as twelve but as "two-helve," and no amount of correction at any later time could change his pronunciation. In both of these instances we have a composition of the character along strictly phonetic lines. In the higher numbers a similar condition prevailed, though in many instances the same sound or set of sounds was represented by different characters. For instance, the "ty" in the higher tens was variously represented. In fifty it was the long heavy curved line, in sixty the crowfoot, and eighty the dot. In each instance this character forms the lower part of these respective characters. In seventy it was the vertical line, and in thirty the crowfoot, which form in these instances the upper part of the character. Forty and ninety are simply four and nine somewhat altered.

As above mentioned, the idea of the addition of ten to the unit in the numbers eleven to nineteen is indicated by joining directly to the characters one to nine certain other characters representing the sounds, not the idea, expressed in "teen." Likewise also in the numbers twenty-one to twenty-nine. The upper part of the character twenty is joined directly to the unit character and forms an integral part of it. From thirty onward, however, a different method was used. Here the unit character was placed directly after the character representing the particular ten which was being used, thus requiring two independent characters instead of one

802 composite character to represent any particular number. 176 This arrangement of the characters may have been more or less due to the fact that the inventor had seen the 211 English numbers and had had these explained to him. His arrangement of these may possibly have been influenced by the arrangement of the English, and the fact that the lower numbers were not arranged in a similar manner may be because when he invented them he did not thoroughly comprehend this arrangement of the English.

In the accompanying set of these characters it will be observed that in large measure the tens are formed on the units as bases. There are, however, certain exceptions to this rule. For instance, ten, twenty, and thirty are evidently formed independently without taking the numbers one, two, and three into consideration. The remainder of the tens, however, from forty to ninety inclusive, are palpably formed directly from the units four to nine inclusive by the simple addition of some extra stroke or by the alteration of the unit character.

In view of the above-mentioned phonetic nature of this whole system it appears natural that these three numbers, ten, twenty, and thirty, should be different from their corresponding units, since the sounds involved in these three are very different from the sounds involved in the same units. Attention should be called also to the fact that the character thirty strongly resembles thirteen and that to the informant's mind the upper branching portion of the character thirteen represented the portion of this numeral which we pronounce "thir," while the crowfoot below represented "teen," and that likewise the very similar lower portion of the character thirty represented the same sound "thir" while the crowfoot above it represented "ty."

802
176
211

It is therefore evident that, while this set of characters is strictly mnemonic in its use, it is formed on a phonetic basis. It is, as first stated, the original invention of a single individual and in no way represents a tribal characteristic, but with it at hand this individual appeared to be greatly assisted in his difficult task of learning to count in English, and so assiduously did he study his system that in the course of a short time he was able to count fluently from one to one hundred. For a considerable length of time he was unable to do this without the aid of his set of numeral characters, but ultimately, of course, he became so familiar with this that he repeated them easily from memory.

# INDEX

*Achote*, 69–70, 190, 296, 318, 364. See *Dyes*
*Adzes*, 138–140
*Agriculture*, 37, 43, 72, 79–111
*Alligator* eggs as food, 73; in designs, 287
*Amazon* basin, 2
*American Geographical Society*, xvi
*Amphibians*, 14
*Amusements*. See *Dolls; Toys*
*Animal designs*, 288–311
*Animals* in myth, 382; of cave spirits, 363, 368
*Ants*, 17–22
*Aridity*. See *Climate*
*Axes* used by shamans, 350

*Baake, William*, xv
*Bait*, 235. See *Fishing*
*Balsa wood*, 47, 165
*Bamboo*, 7, 330, 385; quiver of, 115
*Bananas*, 36, 72, 79, 82
*Bandilas technic*, 228–232. See *Textiles*
*Baptism*, 318–319
*Barbacoas stock*, 26, 29, 30
*Bark cloth*, 106–108, 163, 183, 290
*Basketry*, 184–237, 299. See *Textiles*
*Bazurco, Santiago M.*, xv
*Beads*, necklaces of, 66. See *Ornaments*
*Beeswax*, 22, 87, 111, 112, 129, 142–145, 180, 181, 349
*Beetles*. See *Insects*
*Beetle-wings*, necklaces of, 23
*Bejuco*, 344, 350
*Belts*, 273
*Benches*, 154–158. See *Seats*
*Benediction*, 325
*Beuchat, H.*, cited, 29
*Birds*, 13, 72; in designs, 287, 289–311; in myth, 382; of cave spirits, 363, 368
*Birth*, 317–318, 383. See *Children*

*Blow-guns*, 64, 111–119, 133
*Boda*, 397–407. See *Fiesta*
*Body-painting*, 63, 69–71, 163, 285, 290; by spirits, 374. See *Face-painting*
*Borbon*, 37
*Bowls*, wooden, 161
*Bows and arrows*, 111, 119, 133
*Boys*, instruction of, 42. See *Children*
*Brea*. See *Beeswax*
*Brinton, D. G.*, 26–28
*Brushes*, 142
*Buenaventura*, xii
*Burden-bands*, 236–239
*Burden-baskets*. See *Basketry*

*Cacao*, 43, 72, 79, 92–94, 152, 251
*Capes*, basketry, 236
*Caimitos*, 72, 110
*Calabash* used in weaving, 272; utensils, 86, 90, 104, 108–109, 158, 166–173, 285, 288, 293, 390. See *Gourds*
*Camarones, Rio*, 35, 152, 403
*Cane-mills*, 60–61, 83–92
*Canoes*, 43, 107, 110, 111, 133–134, 171, 251, 285–286; attacked by spirits, 377. See *Fishing*; *Travel*
*Castigation*, 325, 386–387, 392–393, 402–407. See *Punishment*
*Catholic influence*, 316–323, 329, 331, 359, 383, 387, 395–396
*Cat-o'-nine-tails*, 322, 387, 393. See *Castigation*
*Cave spirits*, 363–369, 374–375
*Cayapas, Rio*, xiii, xiv, 1–5, 16, 18, 29, 32, 35, 37, 38, 49, 60, 108, 151–152, 165, 198, 313, 352, 355, 361, 369–371, 373, 379, 454
*Centipedes*, 17. See *Insects*
*Cephalic index*, 409–411, 444–445
*Ceremonies*, 104, 383–407. See *Fiesta*
*Chapil*, 190, 230. See *Palm*
*Charco*, 379, 380
*Chiefs*. See *Government*
*Children*, 42–44, 134, 152, 317; clothing of, 68–69. See *Names*
*Chocolate*, 174; stirrers, 160. See *Cacao*
*Chocolatillo*. See *Basketry*

3: Barrett E-5 (1908-1909) 1925

SD6 Cayapa SD6

# INDEX

Chicha, 80, 195, 203, 227, 352
Chonta dura, 98–99
Christians, 383, 394–395
[illegible], 61–63
Clay, sinkers of, 181; used with blow-gun, 116. See *Pottery*
Climate, 3
Cloth. See *Bark-cloth; Textiles*
Clothing, 63–71, 152; of Indios Bravos, 32. See *Dress; Textiles; Weaving*
Cockroaches, 18
[illegible], 29
Coconuts, 72, 79, 102, 168
Coffins, 330
Coins, necklaces of, 66
Colombia, tribes in, 29, 30
Color, skin, 414–416
*Colorados Indians*, 26, 27, 29, 30
Cooking. See *Food; Pottery*
*Cooking implements*, 159–162, 172
Copper, ornaments of, 24
Cordage, 274–285, 393. See *Fiber; Nets and Netting*
Corn, 77, 79, 96–98, 161, 162, 172, 322
*Corriente Grande*, 2
[illegible], 280
Cosmology, 352–356
*Cotacachi, Mt.*, 1, 30
Cotton, 79, 103, 113, 183, 251–253. See *Textiles*
Courtship, 321–322
[illegible], 317
Crab in designs, 288, 290–311. See *Land-crabs*
Cradles. See *Hammocks*
Creation, 355–356
Crime, 38–39, 315. See *Punishment*
[illegible], 184, 190. See *Basketry*
[illegible], decoration with, 67
Crustacea, 15
*Cuaiqueros Indians*, 27

*Dabale, Rio*, 1
Daily life, 39–45
Dances, 325–329
Darts. See *Blow-guns*

*Daule, Rio*, 27
*Deadfall.* See *Traps*
*Death*, 330–334, 383. See *Souls*
*Decorative art*, 71, 183, 285–311
*Depredations*, 38
*Designs* on basketry, 199; on calabash utensils, 168–169, 173; on canoes, 142–143; on mashers, 160; on paddles, 150; on pottery, 179; on textiles, 183. See *Body-painting; Decorative art*
*Dip-nets*, 78. See *Fishing*
*Diseases*, 15, 16, 26
*Distillation*, 163. See *Rum*
*Divorce*, 329–330
*Doctors.* See *Shamanism*
*Dog* in designs, 287, 292
*Dolls*, 43, 158–159, 285–287
*Dot design*, 292–293
*Dô technic*, 223–228
*Dress.* See *Clothing*
*Drums.* See *Musical instruments*
*Dumarest Brothers*, xiv
*Dwarfs*, 360
*Dwellings.* See *Houses; Pile-dwellings*
*Dyes*, 258–259. See *Pigments*

*Ear-ornaments*, 66, 67
*Earthquakes*, 376
*Easter*, 383. See *Fiesta de Semana Santa*
*Eggs*, 72–73, 287, 323, 353, 364
*El Morro island*, xiii
*Esmeraldas*, xii, 1, 28, 33, 35, 102, 387
*Esmeraldas province*, xiii, 1, 16, 24, 25, 37–38
*Esmeraldas, Rio*, 4, 26, 33, 252
*Etiquette*, 321, 403
*Eye designs*, 289–311
*Eyes*, 413

*Face-painting*, 165, 190, 287; by spirits, 364. See *Body-painting; Painting*
*Facial index*, 442
*Family life*, 39–40, 42–43
*Fans*, 183–185, 239–248, 285, 289

*Fauna*, 11–25
*Feast* for the dead, 391. See *Fiestas*; *Wedding-feast*
*Fiber*, palm, 101–102. See *Cotton*; *Piña fiber*; *Spinning*; *Textiles*; *Weaving*
*Field Museum of Natural History*, xvi
*Fiesta de Agosto*, 384, 395–397
*Fiesta de Noche Buena*, 394–395
*Fiesta de Semana Santa*, 60, 384–394
*Fiestas*, 314
*Fish*, 14, 72; how cooked, 75–76
*Fishing*, 36, 41, 121–132
*Fleas*, 15–16, 25
*Flora*. See *Trees*
*Food*, 72–78; at fiesta, 398–400; insects as, 22–23. See *Feast*; *Game*

*Gallapagos islands*, 3
*Game*, 11–15. See *Hunting*
*Genesis*. See *Creation*
*Geographical situation*, xvi
*Giants*, 352, 360, 361, 371–372, 375
*Gifts*, wedding, 322
*Girls*, duties of, 40. See *Children*
*Glossary* of manta designs, 307–311
*Godparents*, 324
*Gold*, ornaments of, 24. See *Metal-work*; *Treasure*
*Gorgona island*, 30, 347
*Gourds*, tops made of, 43. See *Calabash*
*Government*, 40, 312–316
*Grubs*. See *Larvæ*
*Guabos*, 72, 109–110
*Guarapo*. See *Rum*; *Sugar-cane*
*Guayabamba, Rio*, 370
*Guayacan*, 7, 9, 46, 134, 147–148
*Guayaquil*, 16, 25; Gulf of, 27

*Habitat*, 1, 31
*Hair*, 411–412
*Hair-dressing*, 69
*Hammocks*, 68, 251, 284–285
*Hampers*. See *Basketry*
*Handles*, basketry, 236–237

*Hats*, 66
*Health conditions*, 25–26
*Hedian, George D.*, xii–xiv
*Herradura*, 35, 40, 367, 377, 378
*Heye, George G.*, xi, xvi
*Heye, Marie Antoinette*, expedition, xi
*History*, 31–39
*Hoja blanca*, 10, 86, 103, 152, 189–190, 323. See *Basketry*
*Hoja de chapil*, 184, 190. See *Basketry*
*Hoja negra*, 184, 190. See *Basketry*
*Hooks*, wooden, 163. See *Fishing*
*Horse* in designs, 288
*Horses*, 31
*Hospitality*, 152–153
*Houses*, 5, 45–63, 313, 332–333
*Human form* in designs, 287
*Hunters* attacked by spirits, 375
*Hunting*, 41, 111–121

*Ibarra*, 2, 30, 31, 39, 356
*Iguana* as food, 72–73
*Illness* caused by spirits, 364. See *Diseases*; *Medicine*
*Images*, 60, 326, 389–391, 394. See *Dolls*
*Implements*. See *Calabash*; *Stone*; *Wood*
*Inca*, 30, 31. See *Quichua*
*Indios Bravos*, 32–35, 369–371
*Insects*, 15–25; as food, 23, 73, 75; in designs, 290–311
*Intoxicants*. See *Rum*
*Iscuandes Indians*, 27
*Ivory-nut*. See *Tagua*

*Jaguars*, 363, 368; carved on seats, 287; in myth, 31, 382

*Ka'pü technic*, 207–216
*Kechua*. See *Quichua*
*Kinship*, 334–343
*Knives* of cane, 276
*Königliches Museum für Völkerkunde*, xv
*Kú'me spirits*, 373–374

*Lances*, 111, 118, 133
*Land-crabs*, 19, 78. See *Crabs*
*Language* of the Cayapa, xv. See *Linguistic relations*

281 *Larvae* as food, 23, 73, 77
*Lashing*, 322. See *Cordage*; *Rope*
*La Tola*, xiii, 393–396
*La Tolita*, xi, xiii, xiv, 24, 33, 39
*Laws*. See *Government*
*Leaves*, necklaces of, 66. See *Palms*
*Lemons*, 110, 116
*Lightning*, 362
*Limes*, 110, 116
*Linguistic relations*, 27–30
*Lips*, 413
*Lizard in designs*, 288. See *Reptiles*
*Looms*. See *Textiles*; *Weaving*
*Love-charms*, 321
*Love-songs*, 321

*Machetes*, 157–158, 168–170
*Magic*, 33–35, 321, 330, 371. See *Sorcery*
*Malaria*, 16, 26
*Mammals*, 12, 72
*Manabí*, 6, 156, 287
*Manimis Indians*, 27
*Mantas*, 273; designs on, 289–311. See *Dress*; *Textiles*; *Weaving*
*Manufactures*, 133–285
*Marimba*. See *Musical instruments*
*Marriage*, 315, 321–330, 363, 401
*Marriage feast*. See *Boda*
*Material culture*, 65
*Mats*, 163, 183, 248–251, 285, 299
*Mealing-stones*, 163–165
*Meat*, how cooked, 75–76
*Medicine practices*, 165, 346–352, 357–359
*Mesh-sticks*, 281. See *Nets and Netting*
*Metal-work*, ancient, 24, 33
*Migration*, 31, 356
*Mill*. See *Cane-mill*
*Milpesos*. See *Palms*
*Minerals*, 23–25
*Mnemonic writing*, 457–463
*Mochas*, 273–274
*Mollusks*, 14

3; Barrett E-5 (1908-1909)1925

SD 6 Cayapa SD6

*Monkey in designs*, 206, 292
*Monsters*. See *Ghosts*; *Spirits*
*Moon affects house-building*, 57. See *Cosmology*
*Mosquitoes*, 15-16, 25, 349
*Murder*, 313. See *Crime*
*Musical instruments*, 327, 329, 389
*Mythology*, 381-383

*Names*, 316-320
*Nahjara*, 380
*Napo*, *Antonio*, xiv, 93
*Necklaces*, 23, 65-66, 67. See *Ornaments*
*Negroes*, 30-31, 37-39, 56, 96, 99, 165, 314, 332, 352, 370, 387, 395, 406
*Nets and Netting*, 118, 163, 276-292. See *Fishing*
*Nicknames*. See *Names*
*Noche Buena*, 383. See *Christmas*
*Nose*, 412-413, 438-439, 443
*Numeral system*, 448-456
*Nuts*, tops made of, 63, 190. See *Tops*

*Officials*, 326. See *Government*
*Ofrendas*. See *Fiestas*
*Onzole*, *Río*, 35, 37, 61, 377, 379
*Oranges*, 110
*Ornaments*, 63, 326, 415. See *Designs*

*Paddles*, canoe, 147-151, 293, 297; for food, 161. See *Canoes*
*Painting*. See *Body-painting*; *Designs*; *Face-painting*
*Paiä u'bosa spirits*, 375-376
*Pa'Lëmbala spirits*, 376-377
*Palms*, 6, 10-11; a food product, 72, 98-102; used in basketry, 194
*Paludismo*. See *Malaria*
*Pambil*, 198
*Panama*, xii
*Panigualla*, 29
*Pan-pipes*, 66
*Papayas*, 72, 110
*Pantomime-play*, 391
*Patia*, *Río*, 26-27
*Patterns*. See *Designs*; *Ornamentation*

*Pekùrà pi'tyà spirits*, 376
*Poje bravo spirits*, 377
*Pelican designs*, 292
*Pendants*. See *Ornaments*
*Pepper, George H.*, xvi
*Peter, George*, xv
*Physical anthropology*, 408–445
*Picha'lyà* defined, 184. See *Basketry*
*Pictographs*, 457
*Pigments*, 189–190. See *Body-painting; Dyes; Face-painting*
*Pigmies*, 353, 376–377
*Pile-dwellings*, 5, 7. See *Houses*
*Pineapples*, 72, 79, 94–95
*Pita fiber*, 79–80, 105–106, 112, 120, 126, 129–131, 139, 145–147, 184–188. See *Basketry; Cordage; Weaving*
*Pi'tcúlya spirits*, 374–375
*Pi pi'ná spirits*, 379–381
*Plague*, 15, 25. See *Diseases*
*Plantains*, 36, 37, 43, 72–82, 127, 152, 160–162, 164, 165, 172, 181, 273, 322
*Plant designs*, 289–311. See *Designs*
*Plants*, 6
*Platinum ornaments*, 24
*Poisons*, 114–115
*Population*, 1
*Potatoes*, 95
*Potsherds*, spirits in, 359–360; used by shamans, 350
*Pottery*, 158, 161–162, 173–181, 285, 288–289, 324; of La Tolita, 33
*Precipitation*. See *Climate*
*Property*, destruction of, 334
*Puberty*, 320, 383
*Pueblo Viejo*, 1, 31–33, 35, 36, 39, 133, 356
*Punishment*, 38, 43, 314, 316, 401. See *Castigation*
*Punta Venado*, xiv, 18, 29, 37, 49, 60, 62, 81, 83, 313, 350, 375, 385

*Quichua*, 30, 31, 356
*Quito*, 2, 29, 88, 370, 372
*Quiver* for blow-gun, 113, 115–116

*Rain*. See *Climate*

**3: Barrett E-5 (1908-1909)1925**
**SD 6 Cayapa SD6**

*Ramírez, Calixto*, xiii, 20
*Rampile*, 188. See *Basketry*
*Ranchos*, 58–60
*Rapids* of Rio Cayapas, 2
*Rascadera*, 79, 95–96
*Rattles*. See *Musical instruments*
*Relationships*, 446–447. See *Kinship*
*Religion*, 352–381
*Reptiles*, 14; in designs, 290; tabooed, 72
*Rio*. See the name of the stream
*Rivet, P.*, cited, 29
*Roots*. See *Pita fiber*
*Rope*, 136–137, 186. See *Cordage*
*Rosario*, Rio, 1
*Rubber*, 79, 152
*Rum*, 76, 82–92, 181, 323, 344, 350, 390, 405–406. See *Distillation; Sugar-cane*

*Sacchas Indians*, 27
*Saija, Rio*, 30
*Sánchez, Manuel*, xiii
——, *Maximiliano*, xiii
——, *Pablo I.*, xiii
——, *Señora*, xiii
*Sandals*, absence of, 66
*San Juan dance*, 326–329
*San Miguel*, 37, 62, 313
*San Miguel, Rio*, 35, 151
*Santiago, Rio*, xi, 1, 4, 24, 25, 31, 32, 35, 37, 38
*Sapayo Grande*, 37, 62, 313
*Sapayo Grande, Rio*, 35
*Sapotis*, 72
*Saville, Marshall H.*, xi, xii, xvi, 156, 287
*Schmidt, Max*, 183
*Scorpion*, 17; in designs, 288. See *Insects*
*Sea-food*, 78
*Seats*, 156, 285, 287. See *Benches*
*Seeds, ornaments made of*, 65
*Sex* indicated in designs, 287
*Shamans and Shamanism*, 31, 230, 316, 318, 330, 344–352, 357, 361, 374, 379, 381
*Shell*, pendants of, 66

600 *Shellfish* used in dyeing, 258
*Shoes*, absence of, 66
*Silver*, ornaments of, 24
*Sinkers*, 165, 181. See *Fishing*
*Slings*, 133
*Smoke* in shamanism, 344–346
*Smudges*, 144
*Snakes* kept by spirits, 364–366, 368
*Snares*, 118. See *Hunting*
*Social organization*, 39
*Songs.* See *Love-songs*
*Sorcery*, 318. See *Shamans and Shamanism*
*Souls*, 357–359. See *Spirits*
*Sour sap*, 110
*Spaniards*, 31. See *Catholic influence*
*Spears*, 129–130, 370, 389
*Spindles and Spinning*, 42, 163, 235–236, 251–259. See *Weaving*
*Spirits*, 35, 316, 330–334, 360–381. See *Shamans and Shamanism*
*Spoons*, 172
*Stature*, 409, 424
*Stone implements*, 163–165; seats of Manabi, 156; spirits in, 359–360; used by shamans, 350
*Storage*, 179, 181, 235
*Strainers*, 172
*String*, 186, 204–206. See *Cordage*
*Sugar-cane*, 43, 72, 79, 82–92. See *Rum*
*Sun.* See *Cosmology*
*Sweet potatoes*, 75

*Taboo*, 56–57, 72, 317, 320, 332
*Tagua*, 54–55, 76, 99–100, 152
*Tarantulas*, 17
*Tcï'ndc technic*, 217–223
*Technic* of basketry, 191–232; of fans, 239–248
*Telembis Indians*, 27
*Temperature.* See *Climate*
*Textiles*, 183–311; designs on, 289–311
*Thatching*, 189. See *Houses*
*Theft*, 314
*Thrashing.* See *Castigation*

*Thunder*, 360–361, 369
*Tick*, 17; in designs, 288. See *Insects*
*Tobacco*, 79, 103–104
*Tops*, 43, 44, 180
*Torches*, bamboo, 385–386
*Toucan* in myth, 382
*Toys*. See *Dolls; Tops*
*Trade*, 42, 152
*Trails*, 133. See *Travel*
*Traps*, 118–121. See *Hunting*
*Travel*, 133, 150–151, 153, 171, 234–235, 415. See *Canoes*
*Trays* of wood, 161–162
*Treasure*, invisible, 381
*Trees* and plants, 6
*Trejo, José*, xiv
*Tumaco*, xii, xiii, 1, 16, 25, 27, 28, 35
*Turtle in designs*, 288
*Twilling*, 197–207. See *Textiles*

*Umbilicus*, 317–318
*United States Gold Dredging and Rubber Company*, 3
*Universe*, beliefs regarding, 352–355
*Ûra''tū*, 372–373
*Utensils*. See *Calabash; Pottery; Stone; Wood*

*Verde, Rio*, 394
*Villages*, 313

*Wands*, 350
*War*, 118, 132–133
*Wásu tribe*, 33
*Wax*. See *Beeswax*
*Weaving*, 42, 103, 163, 170, 259–274. See *Spinning; Textiles*
*Weber, Rudolf*, xv
*Wedding feast*, 322–325
*Whetstones*, 157–158
*Wickerwork*, 192–197
*Wood*, implements and utensils of, 74, 86, 97, 154–163, 175
*Woodworking*, 7, 41. See *Canoes*
*Wool*, 183
*Women*, canoeing by, 150–151; clothing of, 67–69; planting by, 81; work of, 40, 42

000 *Wrist-bands*, 65–66. See *Clothing; Ornaments*
*Writing*, mnemonic, 457–463

*Yams*, 79–95
*Yannuzzelli, Antonio*, xiv
——, *Donato*, xiv, 408
*Yellow-fever*, 15, 25
*Yucca*, 72, 75, 77, 79, 95

*Zenith*, 353
*Zigzag designs*, 289–311